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SCIENCE AND INDUSTRY

Contractors and Engineers Monthly

Vol. 46, No. 12 DECEMBER, 1949 $3 a Year, 50 Cents a Copy

Covering the Field

- **Winter Maintenance**
  Rotaries, radio, and wide right-of-way are the three R's of snow removal in a Minnesota county. See page 1.
  As for ice control, proper storage of treated abrasives is a must, says page 26.

- **Water, Sewerage Lines Improved**
  As told on page 1, the $2,000,000 project, calling for pipe lines, wells, tanks, and pumps, was split into many contracts.

- **Viaduct Job—No Waste Motion**
  Assembly-line techniques applied to a concrete viaduct paid off. Judge for yourself; turn to page 2.

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DEC 9 1949

- **Airport for Mountain City**
  Despite a mile-high site, ground water made for mucky grading and drainage and necessitated a granular sub-base. See page 5 for full details.

- **Building Construction**
  The $900,000 contract reported on page 11 provides seamen of Mobile, Ala., with a new 4-story steel and concrete club.
  The $1,000,000 contract reported on page 62 provides a manufacturer with a 6-story concrete and brick warehouse.

- **Bituminous Paving**
  Seven bituminous contractors team up to resurface 1 mile in 1 day. See page 17.
  A 12-foot sand road is converted into an 18-foot black-top highway. See page 45.
  Brand-new machines and operators old in experience make an excellent showing on a plant-mix job covered on page 65.

- **Medicine Creek Dam**
  It is winding up almost 2 years ahead of schedule, thanks to the vigorous methods described and pictured on pages 20-21.

- **Roadway Grading in Rock**
  A geologist's dream, but a contractor's nightmare were the varieties and crazy pattern of rock and soil. Reported on page 28.

- **Dredging Widens Channel**
  First a drill boat to loosen rock, then the hydraulic dredge Jamaica saw service in Tampa Harbor. Story on page 34.

- **Highway Doctoring**
  It's easy—when you have know-how, ingenuity, and loyalty in your outfit, says Nevada's Division 1. See page 37.

- **Bridge Girder Tested**
  Designed for the first U. S. prestressed bridge, the girder withstood weight 11 times its working load. Page 52.

- **Concrete Road for Heavy Traffic**
  A 22-foot pavement of the beach-resort road was flanked by 9-foot bituminous lanes. Page 57 describes the whole job.

- **Safety Congress**
  Its message, conveyed on page 74: accident prevention pays off in real savings—in one case, to the tune of $584,000!

- **ARBA Fall Conference**
  Have any views about upping Uncle Sam's share in road costs? Turn to page 81 and listen in on the conference debate.

(You will find "In This Issue" on page 4.)

Rotary Plows Aid County Snow Fight

Two Heavy Machines Help Other Equipment to Plow Snow From Vulnerable County System

✦ NOVEMBER. Duck hunting season. City drivers on the roads.

Erwin S. Ward, County Engineer for Kandiyohi County, Minn., glanced out his office window one November day last year and watched the gray sky thicken. Over the bleak landscape, east of his headquarters at Willmar, the first flakes began to fall. Ward came to life as the voice of Eugene Erickson, his Maintenance Superintendent, came in over the radio.

"This looks bad," said Erickson. "I'm calling everything out tonight."

Ward agreed. "It'll probably turn into another 3-day twister," he said. "Oh well, we were all getting too much sleep anyway."

His prediction was not exaggerated. With blinding fury, the storm howled in. In 6 hours it had traffic stopped because of bad visibility. In 12 hours many of the rescued duck hunters from the Twin Cities were sleeping or playing cards in county headquarters. Hotels were full. Every spare room was taken.

For 3 days and nights the storm spent its force. Men and equipment worked until the swirling flakes obscured all visibility; they stood by waiting for the first break to let them out again. In a matter of hours after the stormy winds died down, county roads were open and traffic had resumed.

To the snowfighters of Kandiyohi County, this is all part of the season's work, for the county has the ill fortune to be situated in as bad a snow belt as there is in Minnesota. Anytime from November 1 to April 1, the men can expect storms which seem to run in

Kandiyohi County Highway Dept. Photo
Radio communication for county snow removal? "You bet," says Kandiyohi County, Minn. It saves money there.

cycles of three days' duration.

A Good Organization

Through its administrative central supervision system of organization, the county is very well equipped to deal with snow. The 725-mile system is divided up into 9 sections, each of which is ordinarily maintained in summer by one man and a motor grader, both rented by the hour. During the winter the same motor graders are used for the same sections, each machine then equipped with a heavy V-plow and wing.

At the main Willmar headquarters, a 4-ton International truck with a V-plow and wing is based, along with a 6-ton Walter with a V-plow and Snow-Fighter wing. Two 2-auger Snogo rotaries are also based here, and the county runs four 2-ton trucks with one-way plows. These trucks are rented.

The motor graders with their plowing equipment have a certain specified run to make, while the other equipment is sent wherever it is needed by means of radio. Kandiyohi County has 9 two-way sets, made in the early 1940's by the NYA. It plans soon to buy more modern equipment, although the present communications system has on more than one occasion startled the local Scandinavians.

There was the time, for example, when a farmer's wife was stranded in

(Continued on page 79)

NEW SEAMEN'S CLUB BUILT IN MOBILE, ALA.

C. & E. M. Photo
This is the building described on page 11, which J. F. Ewin, Inc., recently completed at a cost of about $900,000. You're looking at it from St. Joseph Street.

Water, Sewerage Utilities Improved

$2,000,000 Project Extends Both Systems in Valdosta, Ga.; Includes Pipe Lines, Wells, Tanks, and Pumps

✦ THE water and sanitary sewerage facilities of Valdosta, Ga., are being improved and extended under a $2,000,000 construction program so that the city can give 100 per cent service with both facilities to all its residents. Previously, approximately 65 per cent of the city had water service, while sewer lines reached only about half the population. The existing inadequate systems, aging and deteriorating over the years, had become a menace to the health and security of Valdosta. Besides the insufficient coverage in area, the water system also lacked the pressure required by modern fire-fighting apparatus.

The south Georgia city planned to do something about this dangerous situation in 1941 when Smith & Gillespie, Engineers, of Jacksonville, Fla., made an engineering study of what was needed, and submitted recommendations for improvements. At that time the cost of the project was estimated at from $1,000,000 to $1,500,000. Then the war came along, preventing the start of this badly needed construction. In June 1948, Smith & Gillespie revised the engineering report, for rising prices had increased the cost of the improvements to $2,000,000. Bonds were sold to finance the necessary extensions, and work got under way in December, 1948, after the letting of the first contract. According to the engineers' estimate, the project will be completed during 1950.

The sanitary sewer work was divided into three projects, and awarded in three contracts, while the improvements to the water distribution system went in a single contract. Other contracts let for the 1949 construction season included one for the erection of two water storage tanks; another for the construction of concrete foundations for these tanks; and one for a complete well house, pump, diesel stand-by, and controls.

Extensive Improvements

Included in the sanitary sewerage portion of the project are (1) new sewage collection lines and rehabilitation of the existing system; (2) pumping stations; and (3) sewage treatment plant and outfall. The estimated cost of these facilities is $1,160,000.

The waterworks improvements will cost around $800,000, and will include (1) plant work: (2) elevated storage tanks; and (3) improvements and extensions to the distribution system. The plant work will consist of a new well with pump, motor, engine, and well house; new aerator, new million-gallon

(Continued on page 69)

SCIENCE AND INDUSTRY

Concrete Viaduct Job Shows Good Progress

Building Contractor on First Bridge Job Tries Unusual Methods With Good Success

✦ A BUILDING contractor with imagination, J. E. Dunn Construction Co. of Kansas City, Mo., used methods normally reserved for the building field to hurry a big $650,000 concrete viaduct to completion. According to the contractor, it was his first venture into bridge building on highway work.

A real "assembly line" method of operation; use of tubular steel building scaffold as support for the heavy concrete viaduct beams; and prefabrication of steel reinforcing on the ground are a few of the schemes Dunn used with such excellent success. The project made excellent progress and kept well ahead of schedule.

Dunn's contract is part of a vast trafficway improvement pattern which has been worked out for Kansas City by engineers of the City, and the Missouri State Highway Department. Federal-Aid funds are also helping to finance construction work. Completion of this contract hurries the day when Kansas City will be able to handle modern traffic in and beyond the city without trouble.

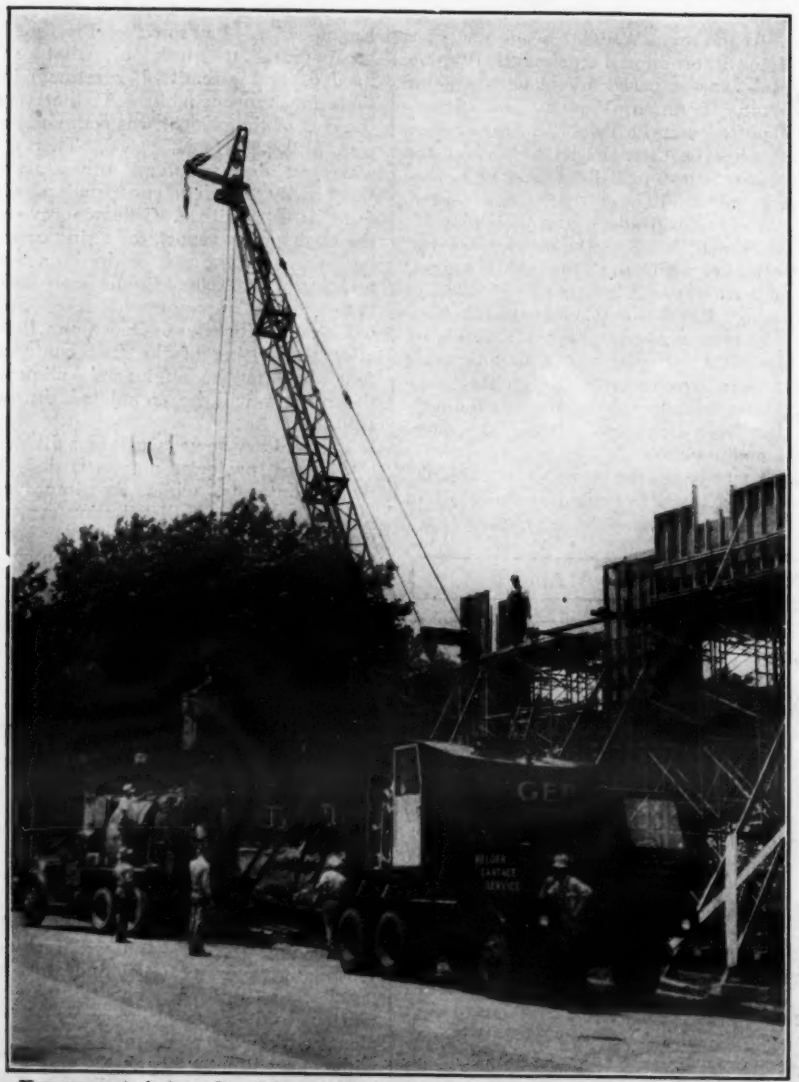
The traffic improvement pattern, treated broadly, consists of three new

(Continued on next page)

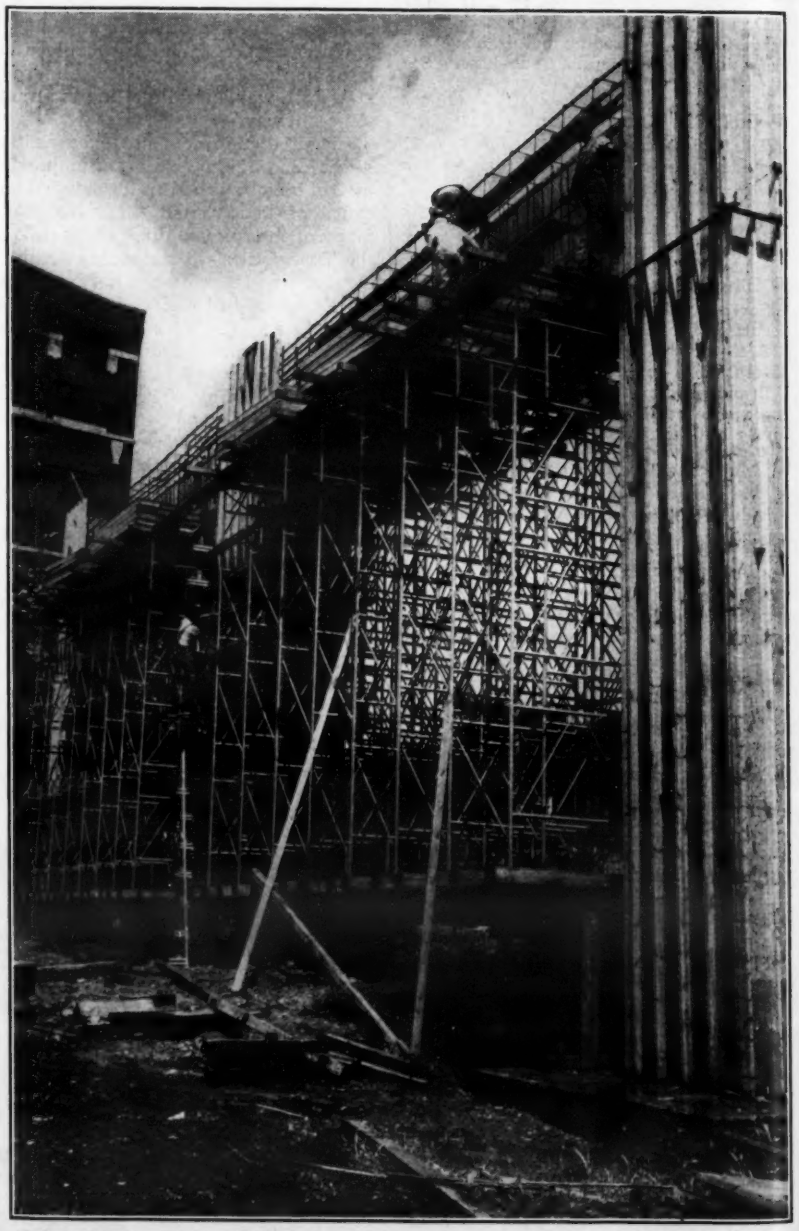
C. & E. M. Photos

Form lumber is shown being raised to the top of a beam on one of the viaduct bents by a Lorain Moto-Crane which Contractor Dunn rented from Belger Cartage Service.

A skid-rig piledriver, with a McKiernan-Terry 9B2 pile hammer in the leads, sets in place steel H-beam bearing piles for the viaduct preparatory to driving.



More concrete is transferred from a truck-mixer to an Insley 1-yard bucket and swung to the pour by a Lorain ¾-yard Moto-Crane.



Safway tubular steel scaffolding on steel H-beams supported the weight of reinforced-concrete beams during a pour. Timber cribbing supported the scaffolding.

crosstown highways. Ultimately there will be a new Missouri River crossing for north-south traffic, and a new east-west highway. Dunn's contract calls for substructure construction of the Southwest Trafficway Viaduct on Highway 69, which leads toward the great southwest through Jackson County, Mo., and eastern Kansas.

In Heart of City

The new viaduct is situated near the heart of Kansas City. It crosses the valley in which are located the Kansas City Union Station and its approaching tracks, passing over Southwest Boulevard near its intersection with 23rd Street Trafficway. The north terminus of the structure is about 100 feet north of 20th Street, west of Pennsylvania Avenue. The south end is about 150 feet south of 25th Street and west of Jefferson.

The new structure crosses above 20th Street, West Pennway, Jefferson Street, 23rd Street Trafficway, Southwest Boulevard, 24th Street, the tracks of the Kansas City Terminal Railway Co., and 25th Street. It consists of 40 concrete deck, steel girder spans varying in length from 45 to 192 feet, supported on 39 reinforced-concrete bents and concrete abutments. Ramps branching from the main viaduct near Southwest Boulevard give access to street levels near West Pennway.

Special batter pile bearing footings were driven to compensate for tie beams at the base of the columns, effecting an impressive saving in contract cost. Ordinary columns in the new structure are 3 x 4 feet, and the average beams measure 30 inches wide x 3 feet 9 inches deep. American Bridge Co. has a contract for the structural steel. This will carry two 37-foot roadways, separated by a 4-foot dividing strip, to be built of concrete. The contract for the deck has not yet been let.

Dunn's working agreement called for all concrete work in bents, retaining walls and abutments; cut stone terminal posts, and the drainage system up to the cast iron drain pipes at deck level.

Real Assembly Line

An excellent, systematic method of moving an assembly line of labor through the project with no lost motion was the organizational highlight of the work. J. E. Dunn, Jr., managed the job personally, and the various phases fitted in beautifully one with the other.

The order of work in this scheme followed the pattern listed as follows:

Excavation: There were about 11,000 cubic yards of dirt in the contract, including unclassified and structure excavation. Handling this dirt was subbed out to Al Kranz Excavating Co. of Kansas City about 6 weeks in advance of the rest of the work.

Kranz hustled through his part of the job by excavating the material with a Northwest ¾-cubic-yard Pullshovel, and hauling it to disposal areas with dump trucks. Part of the structure excavation was stockpiled for use as backfill later on, but a great deal of the dirt was used as backfill in many basements, left behind when homes on the right of way were moved out of the way.

Kranz had finished excavation on 10 bents before any other work was done, and by the time the next phase, piledriving, was 30 per cent finished, Kranz was done and his equipment was off the job.

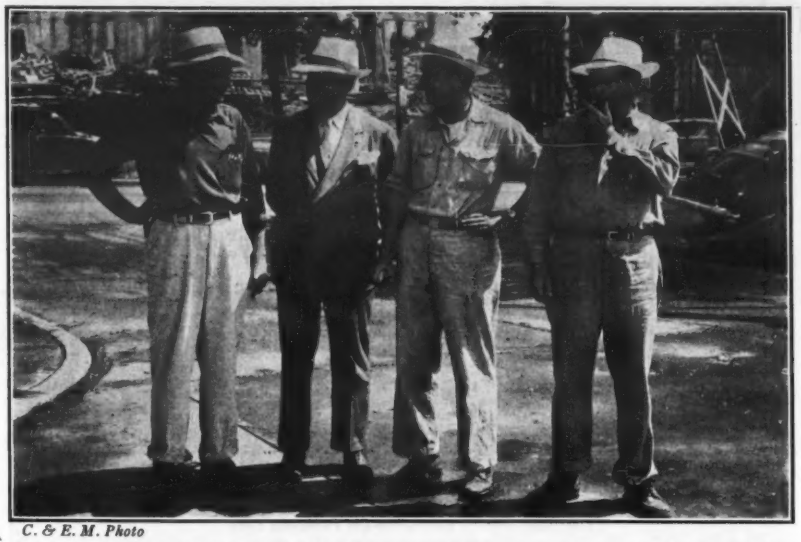
Piledriving: Approximately 50,230 linear feet of steel H-beam bearing piles were required under the bents. This work was also subcontracted, in this case to Everham-Aldridge of Kansas City. Under terms of the contract, all steel piles were furnished by the Missouri State Highway Department.

From 12 to 40 piles were driven under each bent, and there are also some H-beams under the ramp retaining walls. Deep, friction-free overburden above solid rock created a tough piledriving condition, and one pile had to be driven to a penetration of 184 feet before it fetched up with a bearing of 65 tons, as required. Many pieces were over 100 feet long. These were made up during the process of driving by splicing shorter sections together with electric welders.

Everham-Aldridge used a light, fast skid rig to drive the steel H-beams. Mounted on a steel I-beam frame, the piledriver had a 3-drum American hoist with a 75 hp steam boiler, a steel boom 65 feet long and a set of steel leads which hung from the end of this boom. A McKiernan-Terry 9B2 pile hammer was in the leads.

Twelve x 12 inch and 12 x 14 inch skid timbers supported the piledriver. They were placed directly on the ground if possible, or on cribwork if the ground was uneven or soft. A 2 x 6 inch hardwood skid on top of each tim-

(*Continued on page* 15)



C. & E. M. Photo

Officials on the viaduct project hold still a minute for the C. & E. M. camera. They are, left to right, assistant to the Superintendent R. L. Thompson, Jr., R. G. Olson of Stewart Sand & Material Co., General Superintendent J. E. Dunn, Jr., and his other assistant John W. Randolph.

Constructing 4-inch crushed stone base for Texaco Asphalt Macadam surface on a New Jersey highway.

Applying Texaco Asphalt to 3-inch crushed stone wearing surface at rate of 1.78 gal. per square yard.

Spreading small stone to fill voids in the 3-inch surface course.

Follow these steps

for a rugged, economical pavement

A long-lived pavement with a low upkeep cost, Texaco Asphalt Macadam calls for a minimum of large equipment in its construction. An asphalt distributor, roller, blade grader and trucks for hauling aggregate are the only large units required.

Texaco Asphalt Macadam is a good all-around pavement, equally satisfactory for roads, streets, airports or parking areas. The aggregate for the foundation and the wearing surface may be crushed stone, crushed gravel or crushed slag, depending upon availability and cost.

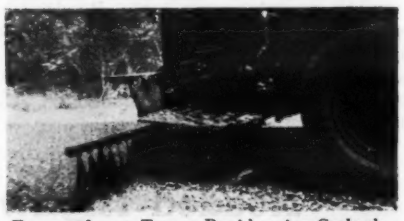
Usually, asphalt cement serves as binder in a Texaco Asphalt Macadam pavement. However, in modified forms of this type of construction, a Texaco cutback asphalt or an emulsified asphalt is substituted for the asphalt cement.

For a complete description of Texaco Asphalt Macadam paving and its modified forms, send for the booklet, "Road Building with Texaco Asphalt by the Pressure Distributor Method."

Samuel Braen's Sons, Hawthorne, New Jersey, were the contractors on this Texaco Asphalt Macadam project in Passaic County, N.J.

The second application of Texaco Asphalt calls for 0.72 gal. per square yard.

Covering again with small stone to fill voids and insure dense, waterproof surface.



For a seal coat, Texaco Rapid-curing Cutback Asphalt is applied at rate of 0.28 gal. per square yard.

The completed Texaco Asphalt Macadam pavement is durable, easy-riding and skid-resistant.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17
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TEXACO ASPHALT

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For the Highway and Heavy-Construction Industry

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Why Road Maintenance Costs More

At the recent 35th annual meeting of the American Association of State Highway Officials in San Antonio, Texas, top-level state and Federal delegates departed from the usual convention speech which repeats what everyone knows—that America's highways are becoming inadequate to handle the ever-swelling volume of traffic. This year they put the finger on a specific reason for this inadequacy, and proposed to do something about it; at least they passed a resolution and hoped that it will have some effect.

The immediate and pressing highway problem, as singled out by the AASHO, is the rapidly rising cost of highway maintenance due largely to excessive loads. The Association, in its resolution, condemned the failure of "some highway users and shippers" to comply with its recommended maximum single-axle load of 18,000 pounds, and pointed out that this practice of overloading is destroying our highways faster than they can be rebuilt. As much of a bite as can be put into a convention resolution was inserted by the AASHO when it urged all states to adopt by law the standard axle loading, and to enforce its provisions vigorously and fearlessly.

Substitute "trucking industry" for "some highway users and shippers" and you will know at whom the big guns of the AASHO were leveled. From venerable Tom MacDonald, boss man of the U. S. Bureau of Public Roads, down through the heads of state highway departments, and from some of the crack road maintenance engineers in the country, came carefully assembled evidence that the big truck carriers are doing a job on the nation's highways—a destructive job that is in no way recompensed by the taxes they pay.

Highways, of course, can be constructed to take these heavy truck and trailer loads, but not on the present revenues. Furthermore, the carriers that are doing the damage represent only 2 per cent of all motor vehicles registered in the country. The solution, as the AASHO sees it, is to compel the trucking industry to cut down on the gross weight of its vehicles, and to distribute that weight properly over enough axles so that no single axle load will be great enough to injure a pavement.

If this aim can be accomplished, then more money will become available for the construction of new roads with funds that now must be spent on maintenance of existing highways. Maintenance costs, for instance, jumped from $890,000,000 in 1946 to $1,080,000,000 in 1947, and are continually increasing.

The motoring public knows full well that the big commercial truckers have all but taken over the main through highways in this country. Their huge juggernauts, racing downhill at top speed and crawling up a grade at snail's pace so that none may pass, are a dangerous hazard to safe driving. But the public is not fully acquainted with the damage these weighty vehicles are doing to the pavements. As one maintenance engineer warned, "The AASHO better do something about this serious situation before the public takes it out of their hands." The national association has taken a step in the right direction; it is now up to the individual states to follow through.

Needed Highway Revenue

The AASHO, with no reservations about taking on the big ones, also squared off against the petroleum industry at this Texas meeting. In another controversial resolution it struck out at the "obstructionist tax policy" of the oil interests. Delegates from states badly in need of additional highway revenue reported that the petroleum industry, as a matter of policy, opposed virtually any increase in gasoline taxes, however modest and urgent. At the same time, the oil companies were not above slapping on an even greater increase in the price of gasoline to the highway user.

Of course, the highway officials did not delve into the economics of the oil companies to see what lay behind such price increase, viz., increased production costs, transportation, taxes, labor, etc. However, their plea for a new policy of cooperation on the part of the oil industries should be well taken. The petroleum people stand to profit more than anyone from an adequate system of highways.

Stockholders' Report

Out of a committee session on public relations and publicity came what seems to be an excellent proposal by C. Coykendall of the Iowa Good Roads Association. Coykendall, a former Iowa Highway Commission engineer, suggested that state highway departments imitate private industries that issue annual reports to their stockholders on what the company has accomplished during the year. Wide-awake concerns now present these reports in attractive, readable booklets that can be understood by the average layman without the benefit of a course in business finance.

Comparable reports could be compiled by state highway departments and issued for their stockholders—the taxpayers. Such a report would contain, among other things, how much is spent on construction and maintenance each year, the mileage of new and rebuilt highways, programs for future work—to mention but a few of the possible contents. These data are usually available anyway, but they are seldom presented in an interesting, enlightened manner to the public, who after all pays the bills. Such reports would make for better highway public relations.

Contractor for Dam Wins a Safety Award

National Constructors, Inc., Cartersville, Ga., contractor for Allatoona Dam, is the first contractor ever to receive the National Safety Council's Award of Honor for distinguished service to safety. The award was made to K. L. Parker, Project Manager, at the opening session of the Construction Section, National Safety Congress, October 25.

During the three years this $32,000,000 hydroelectric power dam has been under construction, this contractor has maintained an excellent safety record, as follows:

Year	Man-Hours	Lost-Time Injuries
1946	277,311	8
1947	777,676	6
1948	1,191,887	7
1949	485,653	3
Total	2,732,527	24

Year	Days Lost	Frequency Rate	Severity Rate
1946	260	28.85	0.94
1947	259	7.72	0.33
1948	164	5.87	0.14
1949	123	6.18	0.25
Total	806	8.78	0.29

There have been no fatal or permanent disability injuries on this project to date.

In his announcement of the award, Ned H. Dearborn, President of the National Safety Council, said: "This award is given only to those organizations which have achieved an outstanding safety record. National Constructors, in its work on the Allatoona Dam Project, has demonstrated its eligibility to receive this award by establishing rates substantially below the most recent averages for similar organizations and by showing marked improvement in comparison with the previous year."

National Constructors, Inc., was organized for this project and is composed of Arundel Corp. of Baltimore, L. E. Dixon of Los Angeles, and Hardaway Contracting Co., Columbus, Ga. K. L. Parker is Project Manager, and safety engineering has been supervised by William H. Duncan and William I. Sullivan.

Allatoona Dam is being constructed under the supervision of the Corps of Engineers, Department of the Army. Col. W. K. Wilson, Jr., is District Engineer and Charles A. Jackson is Resident Engineer for the Corps of Engineers on the project.

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Highway-Tax Diversion Up 11 Per Cent in 1948

Diversion of highway-user taxes increased 11 per cent in 1948 over 1947, the National Highway Users, Conference reports. Of the $189,370,000 diverted, some $97,000,000 went to state general funds; about $41,000,000 went to county and local general funds; $45,000,000 was lumped under "education"; and $6,000,000 went for other purposes "ranging from mosquito control to harbor development".

New York was the biggest diverter with $71,444,000—almost half the money collected in highway-user taxes—spent for non-highway purposes. Rhode Island was a close second, diverting 40.9 per cent or $4,023,000, and Florida was third, diverting 36.1 per cent or $23,141,000. Delaware, the District of Columbia, Louisiana, and Tennessee were next in order with diversion ranging from 22.8 to 10.4 per cent. These states and the District all lack constitutional safeguards for road funds.

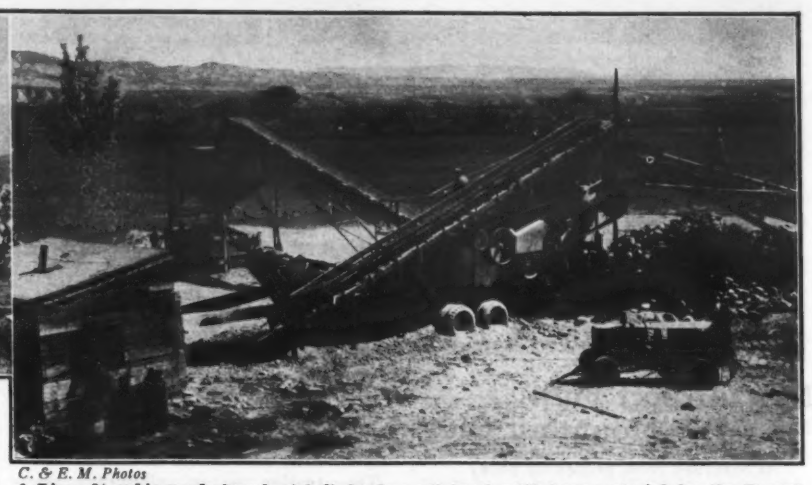
Welded-Bridge Contest

To promote the "building of better bridges for less money", The James F. Lincoln Arc Welding Foundation is sponsoring its second "Welded Bridges of the Future" program. The all-welded bridge to be designed is a two-lane through highway bridge with a span of 250 feet. The type of steel and the loading conditions are specified; otherwise designers are on their own.

First award in the 1950 program will be $5,000; second will be $2,500; and third will be $1,250. Ten honorable-mention awards of $200 each will be made, too. Any designer or engineer who considers himself qualified to enter the program is eligible to do so. The competition opened November 1 of this year and it closes June 30, 1950. To obtain rules and conditions, write to the Foundation at Cleveland 1, Ohio.

S. Edward Frank & Associates Photo

K. L. Parker (left), Project Manager for National Constructors, Inc., receives the National Safety Council's Award of Honor for distinguished service to safety from Otto S. Holmskog, General Chairman of the Construction Section, National Safety Council. National Constructors, contractor for the Allatoona Dam in Georgia, is the first construction firm to receive the award.



C. & E. M. Photos
A Lima ¾-cubic-yard shovel, at left, loads a pit truck with base material for the Vernal Airport. Above is the 48-V Pioneer crusher Colthorp Construction Co. used on the job.

New Airport Built For Mountain City

Heavy Crushed Sub-Base Necessary to Whip Muddy Ground as Water Table Complicates Field Work

+ AN airport over a mile high has been built for the city of Vernal, Utah, despite severe ground water and muddy grading conditions. Colthorp Construction Co. of Rangely, Colo., pushed the $160,000 contract to completion for the Civil Aeronautics Administration, the City of Vernal, and the County of Uintah.

Vernal now is linked to other Rocky Mountain cities by Challenger Air Lines. The airline has been licensed to fly mail and passengers from the new air terminal.

Despite the mile-high altitude, ground water along one end of the main runway was so bad that drainage pipe was laid in water, with three pumps running. Grading was so tough that bulldozers had to shove the wet muck to one side to drain, before Carryalls could load it. The job was whipped only with difficulty.

The Colthorp Construction Co. job marked the first real large-scale construction to be done at the Vernal Airport. Prior to this time the field consisted of short graded strips for private planes, but that was all.

New development under the Colthorp contract was limited to one main runway 5,000 x 150 feet, one taxiway 5,000 x 50 feet, and a parking area approximately 500 feet square. Pavement foundation for the field consists of from 4 to 6 inches of 4-inch-minus gravel, topped by 8 inches of crushed sub-base material of a 2-inch-minus size. The bituminous pavement for taxiway, runway, and plane parking apron consists of 2 inches of bituminous road-mix, made of 1-inch-minus crushed material and SC-3 asphalt.

The new airport is located approximately a mile south and east of the eastern Utah city. Rough mountains form a circle around Vernal, and the terrain is among the oldest, geologically speaking, in Utah. Dakota shales, native rock asphalt, dinosaur beds, and other such evidence of early geological life are seen almost any direction from Vernal.

Drainage Is First Problem

Control of ground water temporarily and permanently was the first problem to be mastered in the job. Plans called for approximately 15,000 linear feet of vitrified clay drains, in sizes from 18 to 48-inch diameter. These drains had to be installed in trenches up to 8 feet deep, and backfilled with granular material to assist the drainage pattern.

Owing to the mud and water toward the south side of the field, a Lima ¾-yard dragline was selected to do the ditch mucking. Had it not been for the severe wet condition, the job could have been easy, because there was no surface rock. But the Lima machine hardly got started before mud began to appear, and throughout most of the south end of the airport the machine had to work on timber mats, crawling around in the mud.

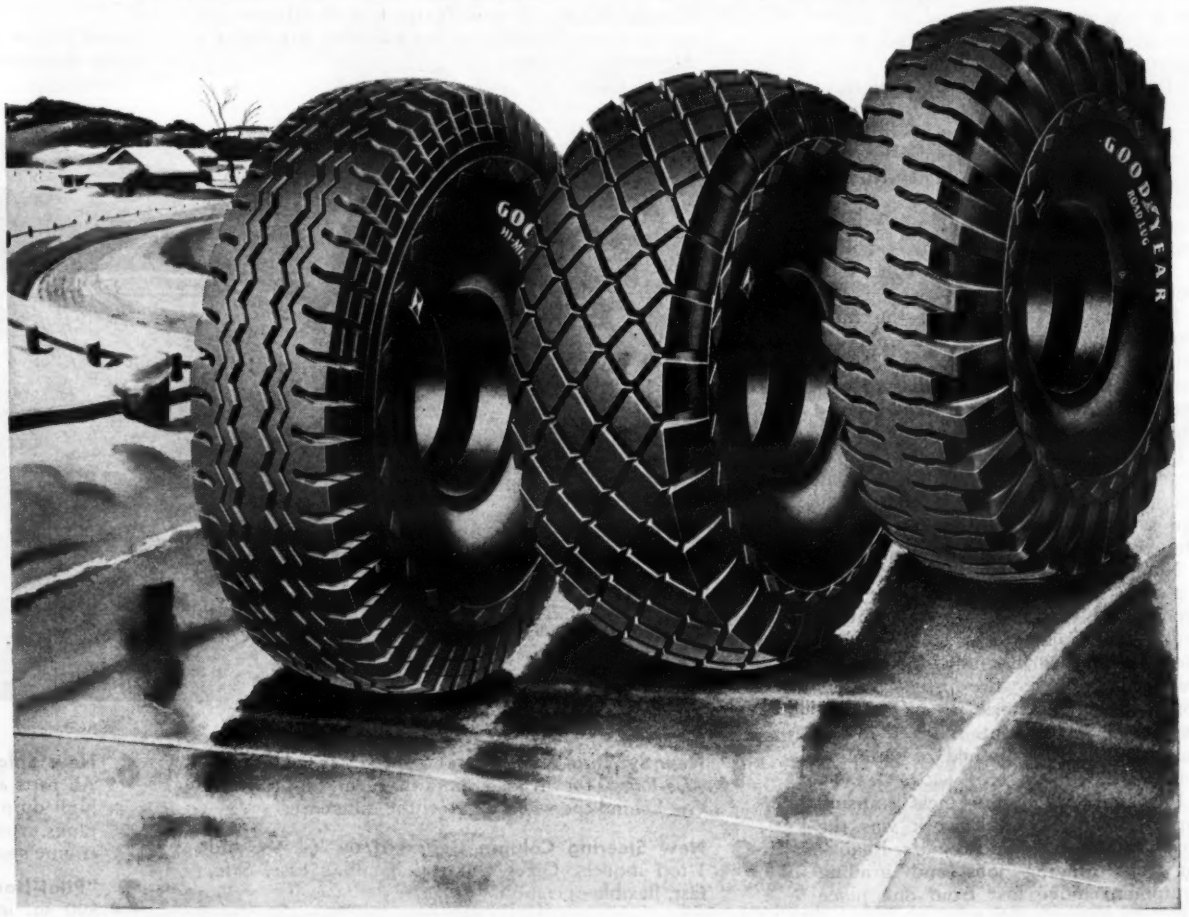
Excavated material, cast off to one side, drained very well, but the ditches soon became streams. Three centrifugal pumps were sent to the job and run day and night, to get rid of the water. Even with this work, it was necessary to lay many of the pipes in water, particularly in the sections where open joints were specified. Men and equipment worked two 8-hour shifts each day, and they finished the muddy

(Continued on next page)

trade SLIP for GRIP

with Goodyear Super-Traction Tires

Give your trucks the maximum protection this winter against the hazards of dangerous skids and slippage with one of these super-traction Goodyear tires. You'll find one of them specially designed for your particular winter hauling needs, to give you better traction, longer life and lower cost-per-mile. Ask your Goodyear dealer now to recommend the *right* Goodyear tire for your job. Remember, always BUY and SPECIFY Goodyear—it pays!



HI-MILER XTRA TRED

Super-mileage plus super-traction! The NEW Hi-Miler Xtra Tred provides as much as 60% more skid resistance than other heavy tread tires—because its flatter tread, zigzag grooves and notches have more road gripping edges. And its non-skid tread is up to 50% deeper for longer, safer wear.

HI-MILER ALL-WEATHER

A tough traction tire with the world-famous Goodyear diamond tread. This time-proved non-skid design provides real road-gripping protection in slippery going. For hauls where experience indicates that extra-tread tires should not be used, the Hi-Miler All-Weather is your best bet.

ROAD LUG

Deep non-skid tread for long wear—resistance to cutting and snagging—alternate long and short bars that dig in for traction. Originally engineered for on- and off-the-road service, but now a big favorite with many operators because of its traction and long life on regular highway hauls.

GOODYEAR

Hi-Miler, Xtra Tred, All-Weather, Road Lug—T.M.'s The Goodyear Tire & Rubber Company

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

C. & E. M. Photos

Gravel sub-base work at Vernal Airport. A Ford truck dumps a load of aggregate against a background of Utah mountains. Next a Caterpillar No. 12 diesel motor grader blades and blends the windrow; and a Buffalo-Springfield tandem roller compacts it.

New Airport Built For Mountain City

(*Continued from preceding page*)

drainage job in about two months. When it was over, all hands breathed a deep, trite sigh of relief.

The drain pipes are now connected to catch basins at strategic spots over the airport, making a comprehensive drainage plan which will keep the ground water down below the compacted part of the subgrade under the pavements.

Grading

Grading was also an easy looking possibility, but was complicated somewhat because of the mud. It was an easy digging, short haul job of 80,000 cubic yards, ideal for tractors and scrapers.

The grading fleet consisted of three Caterpillar D8's, with three LeTourneau LP Carryalls. One D7 with a push block assisted in loading these three units, and one D7 with a bulldozer blade was assigned to miscellaneous leveling, trimming, and the like. Later on it was also used around the crushing plant to maintain the feed at the receiving feeder.

Two sets of sheepsfoot rollers, a motor grader and, ironically enough, a water tank truck, made up the auxiliary processing fleet. The water tank truck was necessary at the north side of the field, and in many cases it hauled water to dry soil while other equipment was having simply a hell of a time farther south, where the mud and water were heavy.

Some of the grading on the main runway was so bad that the Carryalls mired down before they could pick up a load and get out. In these places the D7 and its bulldozer blade saved the day by pushing the mud out laterally. Then after it had drained a day or so, the Carryalls could handle it. They sometimes did immediately, if the ground off to one side was solid enough to carry machines.

None of the cuts or fills were very high, so despite the mud there was plenty of area to work. By moving around from place to place, the equipment kept on working until the grading was all through. Sheepsfoot rollers compacted the material to an average density of 90 per cent, referred to the modified AASHO method of sampling soil weight.

Perhaps one of the most unusual aspects of the grading work was the mobility of service and repairs. Realizing that grading jobs and grading equipment move fast from one place to another, Colthorp Construction Co. some time ago purchased a shop repair trailer, equipped it with certain repair implements, and assigned it to the job.

The trailer is an all-metal war-surplus rig. It has a number of bins for small repair parts in ordinary demand, and storage space for a complete line of mechanic's tools. A Schramm air compressor and light plant are mounted on one end of the trailer. Inside the trailer itself is an 8-inch Sheldon lathe with a 56-inch bed, a grinder, a heavy-duty ½-inch drill, and a valve refacing machine. The latter three are all Black & Decker machines.

Colthorp's low-bed trailer also saw a great deal of service on the Vernal job, hauling heavy equipment to and from the work. It is a Winter-Weiss lowboy, and is pulled by an International truck-tractor.

Rock Crushing Work

Specifications and plans provided a

(*Continued on next page*)

WILLIAMS

"SUPER-HI" TENSILE STEEL

Concrete Form Hardware Clamps—Tie Rods—Couplings and Pigtail Anchors

GREATER SAFETY
LESS WEIGHT TO HANDLE
INVESTIGATE WILLIAMS ECONOMY

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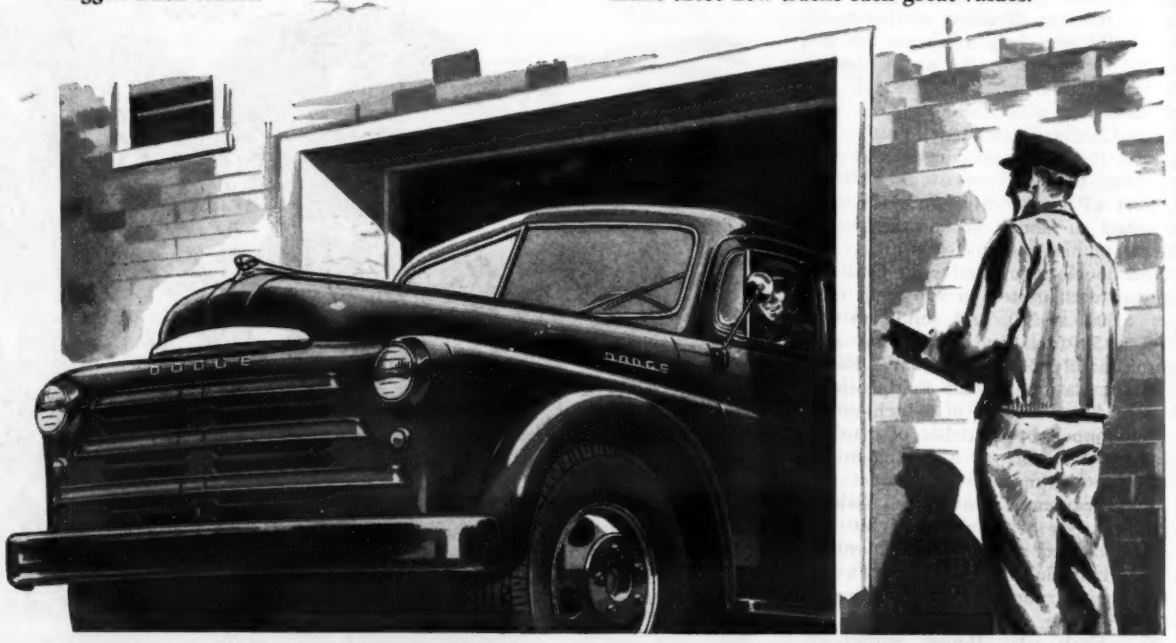
Be sure to see the new line of Dodge *"Job-Rated"* trucks.

Check the many new features and advantages of these new trucks . . . See *why* they are today's *biggest* truck values.

These new Dodge *"Job-Rated"* trucks are priced with the lowest. But remember! It's what you *get* for what you *pay* that counts.

Listed below are just a few of the features that make these new trucks such great values.



1. **New Synchro-Shift** 3-, 4- or 5-speed transmissions—*"Job-Rated"* for the load. Smooth, silent, easy to shift. Get behind the wheel . . . feel the difference.
2. **New Steering Column Gearshift** on ½-, ¾-, and 1-ton models. Gives you real handling ease. Safe, fast, flexible operation.
3. **Short Turning Diameters:** As low as 38 feet for right or left turns. Compare this great advantage with competition.
4. **Top Performance with Economy:** Each truck is powered with a *"Job-Rated"* truck engine. Your power matches your load. Compare Dodge with competition on this important point.
5. **Cyclebonded Brake Linings** (no rivets): Brake linings last longer. No scored brake drums.
6. **New Splash- and Dust-proof Electrical Systems:** All parts and connections positively protected. Extra high output generators and coil; resistor-type spark plugs. Amazingly smooth operation—even at low engine speed.
7. **"Pilot-House" Cabs:** Rear-quarter windows and big 890 sq. in. windshield give safe all-'round vision. Vent wings provide controlled ventilation. You ride in deep-cushioned comfort on a big 57¼-inch seat.

* * * *

See your Dodge dealer *now*. Let him show *ALL* the new Dodge advantages . . . and why Dodge *"Job-Rated"* trucks will give you lowest *operating* costs.

He'll give you a good deal on any one of more than 350 Dodge chassis and body models.

Low down payments. Low monthly payments. Liberal allowance for your used truck.

For the good of your business...

Switch to DODGE "Job-Rated" TRUCKS

borrow site for the granular material which was used in the sub-base, the pavement, and the armor coat. It was located about ¾ mile from the airport in a field towards the northeast, and it soon posed the familiar problem of the job: ground water.

The Lima dragline was changed to a shovel to load raw material from the pit to the crusher, but in order to work efficiently and develop the necessary quantity of crushed rock it had to open up a cut about 10 feet deep. Ten feet of the sand, gravel and boulders in this pit scarcely touched the deposit, but it did expose ground water.

Throughout almost all the job of crushing nearly 50,000 cubic yards of rock, the shovel had to duck ground water while the D7-mounted bulldozer built haul roads for the Federal truck which fed the crusher. The tractor also helped out between drainage and road building by pushing occasional chunks of raw material to the crusher.

The first material to be processed out of the pit was about 26,000 cubic yards of 4-inch-minus crushed-gravel base. Specifications on this material were not too rigid, and could be met by the pit-run material if it was simply passed once through a heavy jaw crusher. A Caterpillar-driven Universal jaw crusher was used entirely for this work.

J. J. Miller, General Superintendent on the job, has worked all over the state of Utah on road-building and rock-crushing work, but he says that the native rock and boulder deposits in the narrow valley at Vernal are the hardest he has ever seen.

"Not many contractors made much money around Vernal in this kind of stuff the first time they took a job here," he explained. "It takes a good crusher to stand the punishment. We had every crushing face built up with hard-facing when we got here, and we'll have it all to do over when we leave, although it hasn't been a big job so far as yardage goes."

Miller at 65 is still going strong, and was assisted by Jim Case, Assistant Superintendent.

The 2-inch-minus crushed-gravel sub-base and everything on top of that level had to be screened, according to the specifications, so a combination crushing and screening unit was brought in and set up. This unit was virtually new. It consisted of a Pioneer 48-V rock plant, powered by a Caterpillar D17000 diesel engine through a flat belt drive. Cables, turnbuckles, and screw jacks were necessary to hold the big engine on line when it began to work.

The 48-V plant operated at an average hourly rate of 200 cubic yards. Raw pit-run material from the shovel had only to be hauled a maximum distance of 350 feet to the receiving hopper, where a reciprocating feeder was located. A 24-inch belt conveyor line carried the material up to the plant, where it passed through an 8 x 36 jaw crusher, a 40 x 22-inch set of rolls, and the double-deck vibrating screens.

The finished product, after passing through the plant, discharged over a stacker conveyor to a small 25-cubic-yard surge bin, under which the hauling fleet of five 8-cubic-yard Ford and Chevrolet dump trucks passed. Each truck was weighed on a set of platform scales as it left the pit, and the driver gave his ticket to the spotter and dump man on the airport.

At the airport, the dump man directed the exact distance in which a truck should be dumped. This insured the proper thickness of material. Especial care was used in spotting and dumping the road-mix mineral filler, because much of it was laid down in windrows before paving equipment arrived.

Road-Mix Goes Down Fast

Mineral aggregate for the bituminous road-mix had been laid well ahead of mixing time, and so the sun had worked with the wind to dry the surface moisture off the material. Blading by a Caterpillar No. 12 motor grader a few days in advance of road-mixing finished the operation.

SC-3 asphalt was furnished to the job by the Wasatch Refinery in Salt Lake City, and trucked to the job, a distance of 170 miles one way. Asphalt deliveries were carefully calculated for a daily volume of 30,000 gallons. Jim Miller, who has mixed up plenty of pavement in nearly four decades in the business, has a unique system.

"When I'm running road-mix, I arrange for the mixer to get an early start. My oil trucks have hauled practically all night to get out to the job. As each transport gets on the job, it hooks on to my Gardner mixer and moves ahead as fast as the mixing machine. The Gardner will unload one of those big transports in about 20 minutes, you know," he explains.

"By running my oil at full speed all morning, I've got my 30,000 gallons down in the windrow say by 1 or 1:30 p.m. It's better than half mixed, too. By that time of the day the sun is out nice and hot, and my Gardner mixer can then finish up the mixing while it's still warm."

The road-mix was not laid down, of course, before it aerated and before a Rosco 2,000-gallon pressure distributor had primed the crushed-rock sub-base. Ordinarily about 0.5 gallon of RC-1 asphalt was used per square yard for this purpose, just ahead of the laydown work on the road-mix.

Compaction of the road-mix, after it had been leveled by a No. 12 Caterpillar motor grader, was done by a 10 to 12-ton Buffalo-Springfield tandem roller. This machine also compacted the rock sub-base.

Specifications also called for the road-mixed pavement to be sealed with a special armor-coat asphalt treatment. This wearing or seal coat consisted of MC-4 asphalt, with crushed rock chips ¼ inch and smaller. The material for chips for this coat was also produced in the crushing plant.

Technical details of design, exploration work, and planning for the new Vernal Airport were handled by Neff

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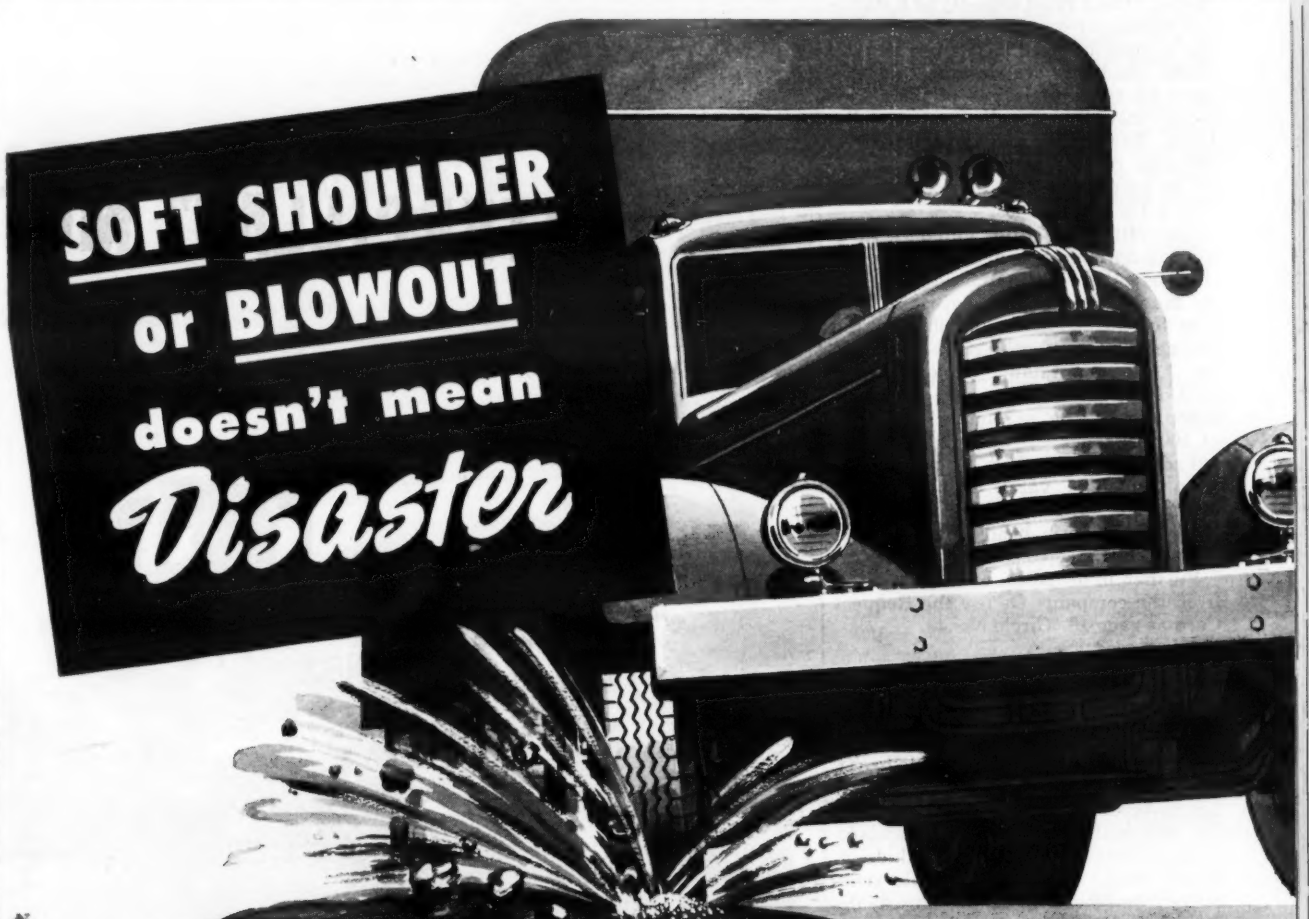

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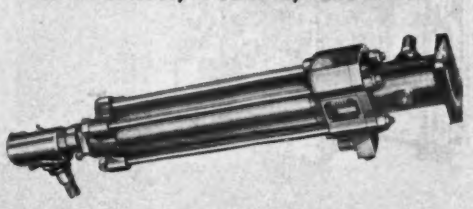
POWER STEERING

There's less hazard when forced off the road onto soft, rocky, rutted or snow banked shoulders . . . when you have Vickers Hydraulic Power Steering. The steering mechanism is hydraulically locked against any road condition reaction. The vehicle can't swerve from road reaction. There's no "wheel fight" to wrench the steering wheel out of the driver's hands. Pull-back onto the road requires only a trigger-pull on the steering wheel.

Vickers Hydraulic Power Steering is safer . . . effortless . . . provides hydraulic power at instant command of the driver to meet any steering requirements. This extra-quick steering increases the ability to maneuver in emergency. The driver is less tired, more alert.

Vickers Hydraulic Power Steering can be used as original equipment, or adapted to most trucks and other vehicles now in service. Write for Bulletins 47-30 and 49-52 covering further details and specifications.

VICKERS
HYDRAULIC POWER STEERING
is Effortless, Positive, Shockless



Vickers Hydraulic Steering Booster with Integral Overload Relief Valve. Bulletin 47-30a.

Vickers Balanced Vane Type Pump is Engine Driven. Bulletins 30-12 and 49-52.

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Airport

(*Continued from preceding page*)

Engineering & Construction Co. of Salt Lake City, architects for the project. Leon Christensen represented the engineering firm as Resident Engineer.

Started June 15, 1948, the new airport facilities were completed and ready for use exactly a year later, as scheduled, despite all the trouble Mother Nature tried to dish up to dissuade hard-working men and their equipment.

New Block Machines

Two new Multico machines for making concrete blocks have been announced by the Multiplex Machinery Corp., Box 53B, Elmore, Ohio. The Model 8 has a rated capacity of 8 standard blocks per minute and the Model 12 has a capacity of 12 blocks per minute. These machines are designed to produce all types and sizes of plain-face block, including regular, veneer, tile, brick, flue, and random ashlar sizes. Modular types are produced in 40, 45, or 50 percent and in a block size of 15⅝ x 7⅝ x 7⅝ inches.

The Multico is fully automatic, requiring no operator. A timer is set for the particular vibration period required for the various types of aggregates. Except for the agitator and vibrator, the Multico is hydraulically powered. A 10-hp 1,150-rpm totally enclosed fan-cooled motor drives the hydraulic pump, producing maximum pressures of 100 psi. Each of the four hydraulic cylinders is controlled by a double-acting solenoid valve excited by an electric starter. The agitator is powered by a 1-hp gear-in-head motor and the vibrator by a 3-hp 3,600-rpm motor.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 40.

Two New Mowers

Two new models of the lawn-type power Moto-Mower are announced by the Moto-Mower Co., 4600 Woodward Ave., Detroit 1, Mich. The 18-inch Lawn-Ace and the 17½-inch Power-Cut are both equipped with standard Moto-Mower parts. These include a 6-inch reel, with five crucible-steel blades, and cutting height adjustable ¾ inch to 1½ inches; V-belt and chain drive; and large sheaves.

Lever control is from the handle bar of the mower. The wheels are 10½ inches in diameter and are equipped with semi-pneumatic tires. The long wheelbase is said to contribute to smooth operation. The Lawn-Ace is powered by a Briggs & Stratton and the Power-Cut by a Clinton engine.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 90.

Bridging for Joists

A new type of steel bridging for reinforcing wood joists is being introduced to the building trades by Dravo Corp., 1203 Dravo Bldg., Pittsburgh 22, Pa. Ready to use without cutting or fitting, Tru-Tye steel bridging comes in one stock size for wood joists of any standard depth installed on 16-inch centers. The steel pieces are said to be rust-proof and ribbed for extra strength. Installation of the steel bridging is accomplished in three steps with only two nails required for each bridge.

The bridging is first placed in line over the top of one joist before the flooring is laid and prongs are driven and countersunk. Flooring then can be laid before further work is done. The next step includes driving one nail through the bridging into the face of the two adjacent joists, holding the bridging rigid with a neat installation. The final step involves bending each end

Steel bridging introduced by the Dravo Corp. for reinforcing wood joists is installed in a three-step operation.

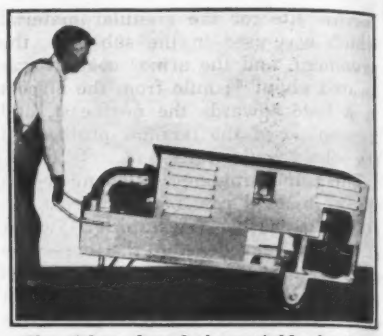
of the bridging around the base of the joists and driving the prongs into place. The bridging then holds the joists in tension and the building framework is permanently reinforced. Strength of the bridging in tension is 2,000 pounds.

Further information may be secured from the company, or by using the Request Card at page 16. Circle No. 71.

Forced-Air Heater

A new forced-air portable heater is now being manufactured by the Scheu Products Co., of Upland, Calif. It is designed to produce 300,000 Btu per hour on 2¼ gallons of fuel oil, and to deliver 1,600 cfm at temperatures up to 300 degrees. The heater is said to project an air stream that reaches over 40 feet without the use of any ducts.

It can be used for space heating, spot heating, pre-heating, thawing, ventilating, curing, drying, and similar applications. The induced-draft vaporizing principle used in this heater eliminates the use of a heat exchanger, fuel pumps, filters, atomizers, valves, jets, and ignition points. An electric or a gasoline-powered blower may be obtained.



The Scheu forced-air portable heater produces 300,000 Btu per hour on 2¼ gallons of fuel oil.

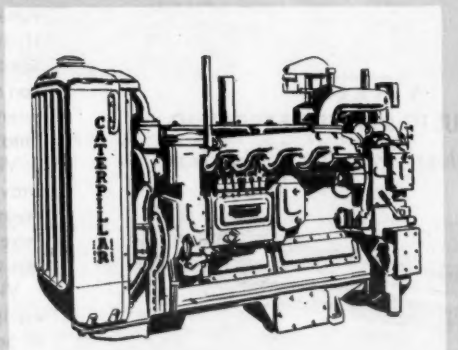
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 61.

"CATERPILLAR" MOTOR GRADERS

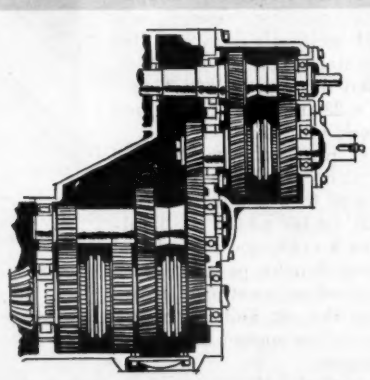
HIGH PRODUCTION . . . calls for the balanced design and matched performance of an all-"Caterpillar" Motor Grader.

PRECISION BLADING . . . calls for the balanced design and matched performance of an all-"Caterpillar" Motor Grader.

Standard "Caterpillar" Diesel Motor Graders are priced as follows: No. 12, $10,920; No. 112, $9545; No. 212, $6435, all prices f.o.b. Peoria, Illinois, subject to change without notice.



ENGINE. The sturdy, dependable, heavy-duty all-"Caterpillar"-built No. 12 Motor Grader Diesel Engine is designed to function as a unit with all other parts of the machine. It has ample speed-and-power to give peak performance—plus ruggedness to meet the gruelling requirements of motor grader operation. Solid aluminum alloy main and connecting rod bearings are important reasons why these engines are so long-lived.



TRANSMISSION. The "Caterpillar" No. 12 Motor Grader transmission is a *constant-mesh helical gear transmission* specially designed and fitted to heavy-duty motor grader use. Yet it shifts with "pleasure car" ease. This, combined with great inherent strength, adds to production ability and motor grader life. Typical of "Caterpillar" quality is the independent gear-type lubricating oil pump which keeps every transmission gear bathed in a full supply of filtered oil.

Convertible Shovel

Production has begun on an addition to the Quick-Way line of truck shovels and cranes. The new Model L, a ½-cubic-yard power shovel or 10-ton-capacity crane, equipped with a heavy-duty 30-foot folding-type boom, has been announced by the "Quick-Way" Truck Shovel Co., P. O. Box 1800, Denver, Colo. With additional attachments, the Model L may also be converted to trench-hoe, dragline, or clamshell.

Powered by an International U-9 motor developing 55 brake horsepower, the basic machine weighs 12,000 pounds. For rapid clamshell operation, cable speeds are the same on both front and rear drums when lagging is used on the haulback drum, the company says. Standard equipment includes drum lagging, hold-in clutch levers with the same operational function as "snap-in" or "toggle-in" clutches, and a combination power trip and automatic tagline winder. Boom extensions of 5, 10, or 20 feet are available. The manufacturer states that most basic parts of the unit are interchangeable with those on the Quick-Way Model E.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 47.

The new Model L Quickway shovel is shown here working in a gravel pit.

ARE *BUILT*—NOT "ASSEMBLED"

Every "Cat" Diesel Motor Grader is *"Caterpillar"-built through and through* —from front wheels to rear—from complete engine to transmission to final drive. All mechanical parts are designed and fitted together for matched performance, correct balance, proper weight distribution, and long life. "Caterpillar" design, engineering and construction are all aimed at helping you get the utmost out of your motor grader investment. The records prove it . . . 99% of all "Caterpillar" Motor Graders ever built are *still on the job!*

Your "Caterpillar" dealer can give you plenty of additional facts and figures. Meantime, write for new booklet, " 'Cat' Motor Graders Do the Job."

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

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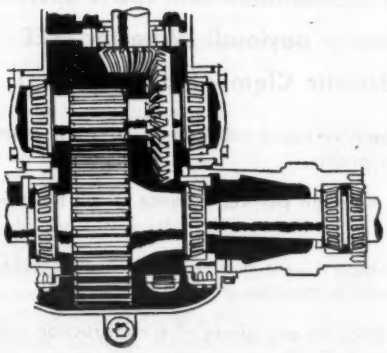
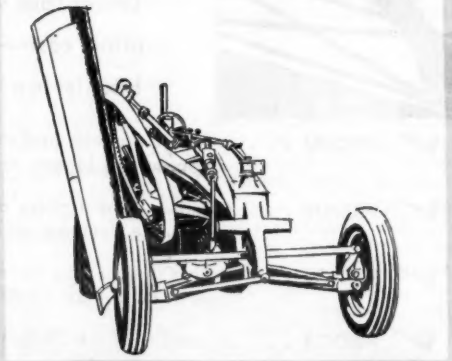
DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



FINAL DRIVE. Heavy-duty engine and transmission require rugged but simple final drive system to keep the motor grader at top working efficiency. Engine horsepower is converted into maximum tractive effort and earthmoving volume through this simple, sturdy system. Tapered bearings throughout keep friction losses at a minimum.



BLADE MECHANISM. The "Caterpillar" Motor Grader frame and blade system fully matches the sturdy in-built quality of the "Cat" Diesel Engine, transmission and final drive. Blade working positions like the one shown here can be made by the operator without leaving his position at the wheel. Mechanical powered controls are unaffected by temperature changes.

New Spraying Hose

A special spray hose, designed and constructed to resist highly aromatic carriers which are particularly destructive to rubber, is announced by The B. F. Goodrich Co., of Akron, Ohio. Useful for weed spraying, the hose is also satisfactory for fungicide and insecticide types of sprays, which usually have oil or aromatic carriers. Common examples are DDT and 2,4-D.

The hose is of the braided type, in black, with a molded cover and a working pressure of 200 psi. The ⅜-inch size has an outside diameter of 11/16 inch, and the ½-inch size an outside diameter of ⅞ inch.

Further information may be secured from the company. Or use the Request Card on page 16. Circle No. 53.

For Installing Conduits

A complete line of hydraulic equipment for installing pipe and conduit is presented in a 4-page bulletin issued by the Blackhawk Mfg. Co., 5535 W. Rogers St., Milwaukee 1, Wis. The company's knock-out punch equipment centers around a hollow-type hydraulic ram of 10-ton capacity for the remote-control Porto-Power hydraulic unit. The punch provides a range of openings from ½-inch to 4-inch diameter.

Other equipment described in the folder includes a thin-wall conduit bender, a rigid-pipe and conduit bender, and an electrically driven hydraulic pump. Specifications, descriptions, and illustrations are given for all units and accessories.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 124.

End-Discharge Mixers

Two 11-cubic-foot end-discharge non-tilt concrete mixers, a 2-wheel and a 4-wheel model, are presented in an 8-page folder offered by The T. L. Smith Co., 2835 N. 32nd St., Milwaukee, Wis. Both models, the catalog points out, are identical except for their trucks. They feature an all-steel large-diameter narrow drum, replaceable drip rings, multiple V-belt drive, enclosed gear reduction running in oil, syphon-type water-measuring tank with calibrated gage, and low-pressure pneumatic-tired roller-bearing disk wheels.

Complete specifications for these mixers are given, along with a general description and illustrations of both models. The photographs highlight the construction features of the Smith mixers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 104.

Gulf Oil Sales Managers

Andrew E. Brice has been named Assistant General Manager of contractor market sales for Gulf Oil Corp., of Pittsburgh, Pa. He will assume responsibility for direct product sales to contracting firms and allied industries. Responsibility for direct product sales to commercial establishments has been assumed by Donald C. Johns, Assistant General Manager of commercial market sales. Both positions are newly created ones.

Detroit Tractor Corp. makes this all-wheel-drive tractor designed for terracing, grading, and snow and ice-clearance work. It is powered by a 4-cylinder 16-hp gasoline engine.

Tractor Features An All-Wheel Drive

An all-wheel-drive tractor has been introduced by the Detroit Tractor Corp., 3400 Scotten Ave., Detroit 10, Mich. Powered by a 4-cylinder 16-hp gasoline engine, this tractor is designed for terracing, grading, and snow and ice-clearance work. Two models are available: the 44-16A with magneto ignition and the 44-16B with self-starter, generator, battery, and lights.

The all-wheel drive gives traction, maneuverability, and positive response to steering levers that control self-energizing brakes on each side of the differential. Pressure on either lever retards wheel rotation on that side, permitting a 5½-foot turning radius, the company says. The progressive-type transmission provides a low speed of 2.75 mph, a high of 7.5 mph, and reverse of 4.0 mph.

Bulldozing or snow-plow blades are mounted on an adjustable frame manually or hydraulically controlled and counterbalanced. The frame is of welded steel construction, and provides adjustment for tread of all four wheels.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 149.

West-Coast Managers

Independent Pneumatic Tool Co., of Aurora, Ill., manufacturer of Thor portable power tools, has appointed two new branch managers. Eugene C. O'Connell, formerly Service Engineer in the Los Angeles branch, is the new Manager at San Francisco. Clarence H. Gabriel, formerly Service Engineer at Salt Lake, is the new Manager at Denver.

Truck Service Body

A new all-purpose service body for use in general contracting work is manufactured by the McCabe-Powers Auto Body Co., 5900 N. Broadway, St. Louis 15, Mo. Designated The Service-Master, this body provides a service unit that carries the workshop to the job site. Weathertight compartments on either side of the body are fitted with shelves, trays, and parts bins to provide orderly storage for a wide variety of parts, fittings, and miscellaneous small tools. To permit arrangements which best suit the needs of the user, the shelves and bin partitions may be adjusted to various positions or removed. Compartment doors may be individually locked.

The body loading space is 48½ inches wide and will accommodate lumber, sand, tires, portable machinery, and other bulky material and equipment. The body floor is of one-piece ribbed-steel construction and is equipped with floor drains. Overhead ladder racks, side-mounted pipe-carrying brackets, heavy-duty rear bumper and step assembly, vise bracket mounted on end gate, and inside tire carrier are offered as optional equipment. Service-Master bodies are available for mounting on ½, ¾, and 1-ton truck chassis.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 1.

An all-purpose service body made by McCabe-Powers, with individually locked weathertight compartments, provides storage for parts and miscellaneous equipment.

NEW! Heating Unit for Winter Jobs

- Ideal for Concrete Work
- Quickly Thaws Out Materials
- Over One Million B.T.U. Output

BEHLEN HEAT BLOWER

$407 FOB Columbus, Nebr.

A sturdy, dependable heating plant. Has many construction uses. Recommended for concrete work in low temperatures. Warms aggregate at batching plant; prevents freezing concrete while setting. Just the thing for drying and curing plaster or paint and other such jobs. Preheats machinery. Burns 1 to 9 gals. distillate or kerosene an hour; furnishes up to 1,100,000 B.T.U.'s direct heat per hour. Built-in fan delivers up to 7,000 CFM at ½ inch water pressure or 5,000 CFM at 5 inches pressure up to 250° F output. Gasoline or electric motor furnished if desired. Adjustable outlet pipe is removable for adapting to fit job. Mounted on skids. Used on Federal and private construction. Almost 3,000 in use on farms dehydrating corn. Beat cold weather delays . . . write, wire for full information . . .

BEHLEN MANUFACTURING CO.
DEPT. 9 COLUMBUS, NEBR.

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- PROOF . . . A winch, a cable, and sturdy lift arms eliminate heavy sub-frames. Tons less dead weight means bigger net loads—greater profits.
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Please send me the FREE booklet on the money-saving Clement "500"
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New Seamen's Club Constructed in Mobile

Modern 4-Story Building Is of Steel and Concrete With 12-Inch Brick and Clay-Tile Walls

By WILLIAM H. QUIRK,
Eastern Editor

(*Photo on page* 1)

✦ CONSTRUCTION of a modern, new Seamen's Club was completed in Mobile, Ala., this past August. The 4-story building with basement and penthouse will replace the Seamen's Institute at 607 Government Street, a frame and stucco 2-story antebellum landmark over 100 years old. The new club has accommodations for 144 in rooms on the second, third and fourth floors. J. P. Ewin, Inc., Engineers and General Contractors of Mobile, was the general contractor on the building which was constructed at a cost of approximately $900,000. Ground was broken for the work the latter part of April, 1948, but later that year a 2-month general strike of construction workers in Mobile held up progress on the project.

The Seamen's Club is located on a block-long lot fronting on St. Joseph Street between Lipscomb and Adams Streets. The plot is 300 feet long, and extends back from St. Joseph Street in an L-shaped layout for a maximum depth of 228 feet. The new location is far better than the old with respect to convenience for the seamen, since the Club is now only three blocks from the Alabama State Docks on the Mobile River.

The club is a long-established non-profit organization for the benefit of seamen attached to ships operating in and out of Mobile harbor. In addition to the sleeping quarters on the upper floors, the Club provides the seamen with such facilities as a library, lounge, chapel, dining room and coffee shop with an up-to-date kitchen, game room, and post-office rental boxes, all located on the first floor along with the lobby and clerk's desk. In the basement, which extends over two-thirds the building area, are moth-proof storage rooms both for duffel and dead-storage gear, a barber shop, and service space for machine and boiler facilities.

Concrete Foundation

The plot of ground now occupied by the club was formerly a used-car sales lot. On the ground the new building measures 201 feet from north to south along St. Joseph Street, x 55 feet deep. The third and fourth floors have a setback along the rear or east side of the building. The foundation is of concrete, the framework of structural steel, and the walls are of brick and clay tile 12 inches thick. Ground elevation is 8.5, while the deepest excavation for the foundation was 15 feet below that level. The excavation was handled by a Michigan truck crane with a clamshell bucket; part of the material was trucked away and sold for fill, while the rest was stockpiled for use as backfill.

Ground water in considerable amount was encountered around +0.9 elevation, necessitating the installation of a Moretrench wellpoint system. Risers were placed on 5-foot centers around the perimeter of the hole connecting to an 8-inch header line and pump. Additional risers were also used at the excavation for the central sump pit within the building lines. Wooden sheeting was required only along the front side of the hole, where the design called for a separate system of columns and beams for the front entrance, which is 30 feet back from the street.

The structural-steel framework is supported on 47 reinforced-concrete footings, a typical footing being 10 feet square x 2 feet thick. At the front center, however, where greater loads are imposed, there is a single footing 56 x 10 x 2 feet thick. Over the entire area is a 10-inch reinforced-concrete slab which serves as the basement floor. From here 13-inch concrete walls extend up to the level of the first floor. The slab was poured directly on the ground, which is a sandy soil mixed with some clay, and which has a maximum bearing capacity of 2,500 pounds to the square foot.

Ready-mix 3,000-pound concrete for the job was supplied by the Radcliff Gravel Co. of Mobile, delivery being made in truck-mixers. Both the reinforcing and structural steel came from the Orleans Material & Equipment Co. of New Orleans, La.

Welded Steel Framework

The truck crane, with a 60-foot boom, also erected the structural steel; a 10-foot jib was added in order to reach the penthouse, the highest part of the building. Up to the third floor the columns are mostly 10-inch H-beams, and 8-inch beams the rest of the way above that. At the single elevator structure two of the steel columns go down to basement level. Otherwise they are anchored to concrete columns that come up to the first-floor level. A typical concrete column is 20 inches square. The entire steel framework is welded together.

Above the basement, the four floor slabs and the roof slab are all concrete 2½ inches thick. At the first-floor slab the steel floor beams are encased in concrete, the entire pour being made in Southern G F metal forms known as a D&R system. The form work was supported with 4 x 4 posts on 4-foot centers both ways, resting on mud sills with wedges to bring them to proper grade. On top of the posts were placed 4 x 4 stringers across which were laid 2 x 10 joists with from 8 to 12-foot

(*Continued on next page*)

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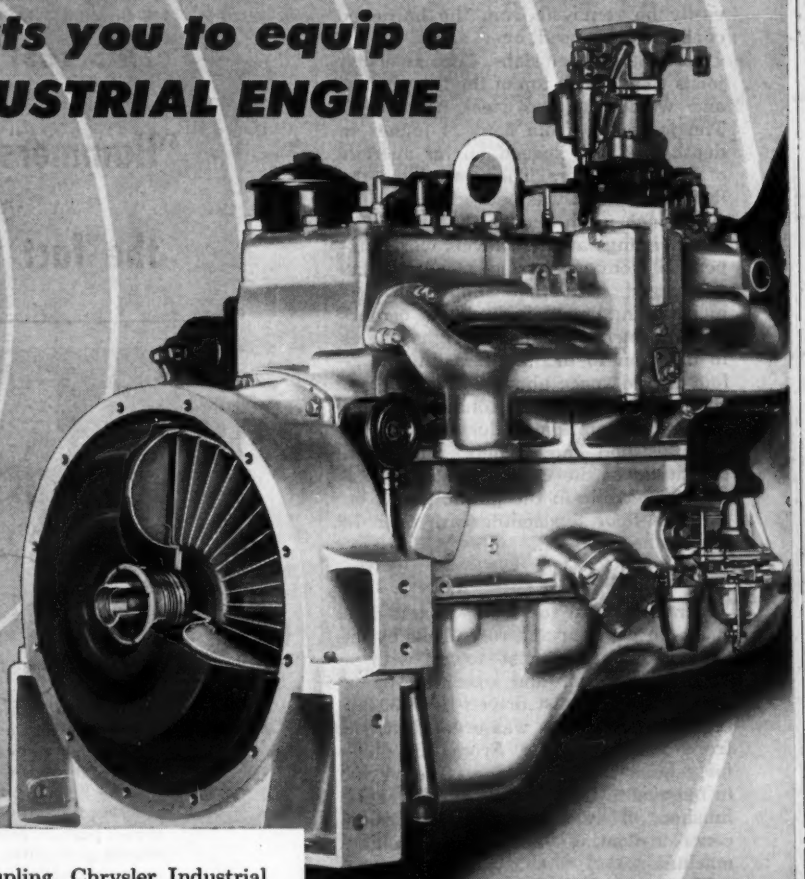

Does operation of your equipment require frequent clutching and de-clutching?

Is your equipment subjected to damaging shock loads? Is it desirable to speed up your engine close to torque peak with the output shaft turning at a lower speed?

Do shock loads sometimes stall your engine or cause failure of drive train parts? Would gradual oil-smooth acceleration improve your operation?

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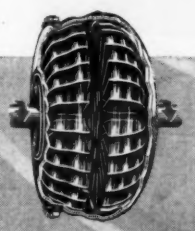

As the driver turns inside the sealed steel drum, the confined oil produces a powerful swirling out-thrust. Instantly the Runner receives the impulsion and transmits smooth power to the load.

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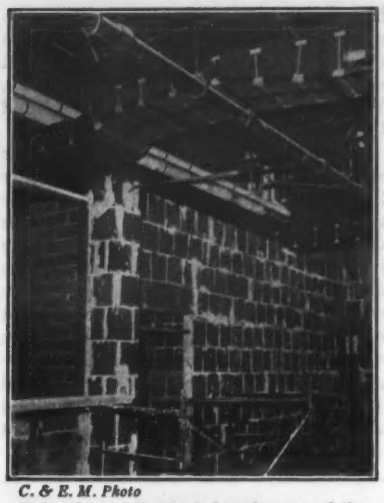


C. & E. M. Photo

This view of the first-floor lounge of the Seamen's Club shows furring above the face brick, a portion of glazed tile at the extreme left, a section of air-conditioning duct above, and Ceco steel bar joists. In front are parts of Patent scaffolding for ceiling work.

New Seamen's Club Constructed in Mobile

(Continued from preceding page)

spans. The metal forms were nailed to the wood and oiled so that they might easily be removed from the hardened concrete and used over again.

At all the other slabs, Ceco steel bar joists were set on top of the floor beams and welded to the steel framework. The joists are from 8 to 14 inches in depth, and are spaced on an average of 22-inch centers. They supported the floor slab which was poured in Steeltex 4 x 8-inch mesh and paper forms. The hung ceilings at these levels were suspended from the bar joists with No. 9 galvanized wire that supported 1½-inch furring channels on 4-foot centers with ¾-inch channels at right angles to them on 15-inch centers. In this 2-foot furred space above the metal lath ceiling are the light conduits, water pipes, air-conditioning ducts, and other facilities. On the second, third, and fourth floors the ceiling heights are 8 to 9 feet, while in the public rooms on the first floor the ceilings are over 10 feet in height.

Materials Handling

Concrete from the truck-mixers was raised to the floor and roof levels by an 84-foot materials-hoist tower with a double platform, and operated by a Clyde 2-drum hoist driven by a 30-hp electric motor. This was erected at the front of the building. From this platform hoist the concrete was conveyed in buggies to the forms. The slabs were finished off by a Whiteman Precision concrete-floating and floor-finishing machine.

Mortars and plasters were mixed on the job in an open-side shed in the yard at the rear of the building. These materials were raised to the desired level by a Jaeger single-drum hoist with a 37-foot self-rising tower set up at the east or rear end of the club. The hoist was driven by a Wisconsin gas engine.

Down the front center portion of the building is cast architectural stone supplied by the Early Studio of Roslyn, Va. On either side this is flanked by buff-color face brick in panels extending from the ground to the roof. Extending out from the building, just below the second-floor level on the north, west, and south sides, is a concrete canopy 2½ feet in width. Below this canopy the face brick is red, while above that the brick is yellow for the rest of the building.

The 4-inch face brick was supplied by the Reliance Brick Co. of Houston, Texas. The common brick, back-up, furring, and partition tile came from the Stevenson Tile & Brick Co. of Birmingham, Ala. Clipper saws were used in cutting the tile. At every sixth course the face brick was anchored to the 8-inch load-bearing clay tile. Patent scaffolding, both interior and exterior types, were employed in setting the brick, tile, and facilities for the hung ceilings. The walls were waterproofed by spraying Ironite against the back side of the back-up tile.

Air-Conditioned Throughout

The Seamen's Club is air-conditioned throughout with a Carrier system. In the basement is a 150-hp compressor machine that takes care of both the first floor and the basement. The other floors are served by separate units. The air ducts are aluminum, covered with Johns-Manville insulation. In the yard at the rear of the building is a 16 x 12 x 22-foot-high cooling tower with a capacity of 624 gpm.

Also in the basement is a transformer vault and two Kewanee boilers, one for heating the building and the other to furnish hot water. Either oil or gas may be used to fuel the boilers.

C. & E. M. Photo

The Ewin Company used this open-side shed for mixing plaster.

In the first-floor lobby the walls are lined to the ceiling with Tennessee marble. The upper floors are served by two steel stairways or an Otis automatic elevator. The second floor contains 28 rooms for the use of seamen and their wives. These rooms are 10 x 15 feet, and have attached private showers and baths. The third and fourth floors are for men only. Each of these floors has 28 rooms which measure 10 x 10 feet and are equipped with toilet and lavatory. The rooms are shared by two seamen. On each floor are two large shower rooms.

(Concluded on next page)

This test "Hammers Home" the fact that...

HIT IT HARD! *Marfak* won't splatter like ordinary grease — proof that heavy loads and rough roads won't hammer it out of spring shackles, tie rods and other chassis parts... proof that *Marfak* gives safer, longer-lasting protection with fewer applications.

Maintenance Costs Less

Because Texaco Marfak won't assures longer

HAMMERING jolts . . . heavy loads . . . road splash — you can protect your chassis bearings against all of them by using *Texaco Marfak*. It's the world's most famous chassis lubricant. *Texaco Marfak* guards bearings against dirt, rust and wear for extra hundreds of miles . . . assures longer life for chassis parts . . . reduces maintenance costs.

To give wheel bearings the same protection, use *Texaco Marfak Heavy Duty*. It seals itself in, assuring safer brak-

ALREADY SOLD —

TEXACO STAR THEATRE presents MILTON BERLE on television every Tuesday night.
METROPOLITAN OPERA broadcasts every Saturday afternoon.

TEXACO

TEXACO

Interior Finish

All the windows are outfitted with Truscon steel sash; the walls and ceiling are plastered and painted. For the sake of lightness in weight, Zonolite plaster aggregate was extensively employed in the ceilings. The floors are covered with asphaltic tile. In the corridors and first-floor rooms the lights are recessed in the metal lath ceiling; in the rooms the lights are hung from the ceiling. As a safety feature a fire door divides the building in half, with a stairway on each side.

Copper water piping is installed throughout. In the bath and shower rooms, ceramic tile extends 4 feet 4 inches above the floor. Above that is a hard-finished plaster made with Keene's cement to withstand the dampness.

Acoustic tile lines the ceiling over most of the first-floor area. The concrete roof slab is topped with 2 inches of Celotex insulation and a 20-year built-up bonded cover.

From the center-panel stone front of the building, small windows are provided for the air-conditioning rooms on each floor. On either side of these are longer windows for the stair towers. Concrete steps, flanked by flower boxes, lead up to the main entrance and lobby of the club.

C. & E. M. Photo
A room on the fourth floor of the new Seamen's Club gets a coat of plaster.

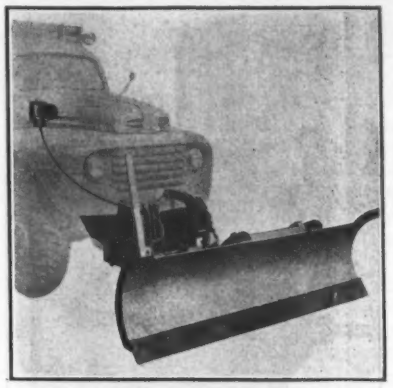
Quantities and Personnel

The major material items involved in this construction included:

Excavation	4,500 cu. yds.
Concrete	1,700 cu. yds.
Reinforcing steel	64 tons
Structural steel	174 tons
Steeltex	39,000 sq. ft.
Common brick	100,000 ea.
Face brick	175,000 ea.
Architectural stone (3 x 4 feet)	3,300 sq. ft.
Tile, structural	100,000 ea.
Ceco bar joists	63 tons
Ceramic tile	17,000 sq. ft.
Terrazzo	4,000 sq. ft.
Asphaltic floor tile	25,000 sq. ft.
Acoustic tile	7,000 sq. ft.
Marble	1,350 sq. ft.

During the peak of the construction up to 140 men were employed on the building. For J. P. Ewin, Inc., Engineers and General Contractors, R. W. Randall was Superintendent.

Seamen's Club was designed by Platt Roberts & Co., Architects, and A. B. Benson and D. W. Long, Jr., Associates of Mobile, Ala. R. S. Christiansen was Consulting Engineer. George E. Blacktopp is Club Director.



The Hydro-Pac conversion unit makes it possible to adapt snow plows and mowers to a power hydraulic lifting system.

New Hydraulic Lift For Snow-Plow Blade

A conversion kit for adapting snow plows and mowers to a power hydraulic lifting system has been announced by the Donnell Hydraulic Co., Garden Prairie, Ill. The unit, the company says, is easily installed and can replace either hand or other mechanical lifts. It requires no changes in rams or lifting arms.

The Hydro-Pac is driven by an electric starter motor which takes its power from the battery on the truck or tractor. No belt or power take-offs are required. The lift is controlled by pressing a button on the dash board. The company explains that control is instantaneous, so that blades and cutter bars can be floated over obstructions.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 62.

Seismograph Surveys; Aid to Construction

Portable Seismograph, Inc., Frost National Bank Bldg., San Antonio, Texas, announces that it is now equipped and ready to make fast, accurate surveys to determine the depth of bedrock; width, direction, and depth of old river beds; location and size of gravel deposits; and to secure other subsurface information necessary to construction and excavation projects.

By using specially constructed portable seismographic equipment and employing the seismic refraction method, the company obtains subsurface information for engineers and contractors.

Trained P-S-I crews of two or more men, as necessary, can be flown with their equipment to site locations. The data obtained from surveys are analyzed and coordinated with geologic data, and furnished in report form to project engineers and contractors for use in determining final location lines, for preparing designs for features of the project, and for estimating excavation and earth-moving costs.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 48.

New Company Will Make Hydraulic Swing Loader

The Mandt Mfg. Co. has been incorporated at Columbus, Ohio, to manufacture and market the Mandt swing loader. This is a hydraulically operated material loader, with a 180-degree swing, which can also be converted by attachments to either a mobile crane or backhoe. It is now in production at the Mandt plant in Warren, Ohio.

O. G. Mandt, who heads the new company, patented and marketed his mobile swinging loader and crane more than 27 years ago, before joining the Jaeger Machine Co. from which he recently retired as President. Other officers of the new company are V. G. Mandt, Vice President in Charge of Sales; J. J. Quilligan, Secretary-Treasurer; and Charles Taylor, Assistant Secretary-Treasurer.

jolt or squeeze out of bearings . . .
life for all chassis parts.

ing . . . seals out dirt and moisture . . . rustproofs the bearing metal. No seasonal change is required.

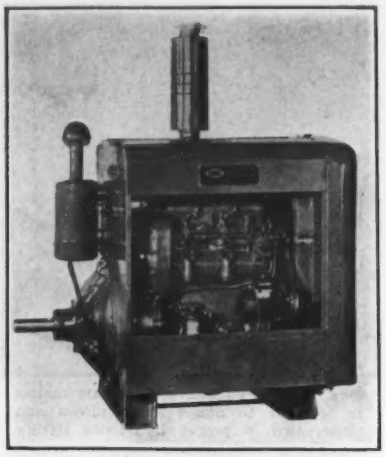
Let a Texaco Lubrication Engineer help you simplify your lubrication procedures . . . get greater efficiency, lower maintenance costs. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

More than 300 Million Pounds of Texaco Marfak!

BETTER PROTECTION FOR CRAWLER TRACK MECHANISMS

Lubricate with *Texaco Track Roll Lubricant*. It gives full, long-lasting protection... effectively seals out dirt and water... reduces wear. It's easy to apply ...economical to use. *Texaco Track Roll Lubricant* assures lower maintenance costs . . . keeps your machines on the job.

Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT



The new P&H 2-cylinder high-speed diesel engine has a rating of 52.5 hp at 1,400 revolutions per minute.

New Diesel Engine

A P&H 2-cylinder high-speed diesel engine has been announced by the Diesel Division of the Harnischfeger Corp. at Port Washington, Wis. It is 28¼ inches wide, 40⅞ inches high, and 32¼ inches long. Weight, complete with cast light-metal-alloy block, is 1,030 pounds. The engine has a rating of 52.5 hp at 1,400 rpm, and operates on a 16 to 1 compression ratio with a displacement of 174 inches. Its extra-heavy crankshaft is specially hardened and magnaflux-tested.

This new two-stroke engine uses the patented P&H cylinder head and liner assembly with a 4½-inch bore and 5½-inch stroke. The cylinder head is interchangeable from one engine to another. Liners are of hardened steel alloy. Water travels upward in the liner and passes between each intake port, controlling the temperature at that point. The intake ports, machined on a compound angle, send the air from a root-type blower into the cylinder in a strong swirling motion to provide thorough scavenging of exhaust gases and complete combustion on the next stroke, according to the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 5.

Black-Top Road Building

A 24-page booklet about road construction and maintenance which calls for application of asphaltic products by the pressure-distributor method is available from the Texas Co., Asphalt Sales Dept., 135 E. 42nd St., New York 17, N.Y. The topics discussed include asphalt macadam, road-mix construction, and surface treatment. Many kinds of jobs are described and illustrated with close-up photographs taken after each stage of construction. The booklet emphasizes the importance of a good base for all paving and surfacing.

The booklet lists designations of the various asphaltic products manufactured by the company. It recommends step-by-step procedures to follow in building each kind of pavement. It tabulates aggregate requirements along with specifications for the proper bituminous products.

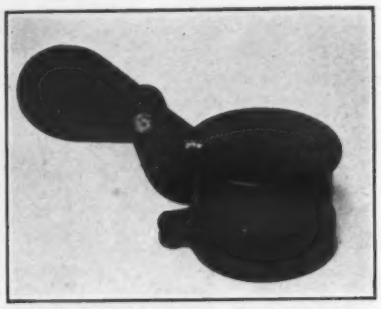
The last pages of the booklet are devoted to useful tables for the road builder covering material requirements for various widths and rate of application, weight and volume relations of mineral aggregate, the temperature at various gage pressures, conversion tables, and a representative list of Texaco asphaltic products and their uses in the road-building field.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 33.

Exhaust Protector

A new and improved Weathercap exhaust protector has been announced by C. R. Taylor & Co., Box 221, Garden City, Kans. This cap, the manufacturer says, will close when leaning at any position more than 30 degrees from the vertical. Its new hinge assembly has a stainless-steel bushing; a 41-40 cadmium-plated steel bolt; and a split-type aircraft locking nut. This enables an operator to take up the side play on the cap as wear develops in the operation.

The counterbalance arm on the new model is ⅛ instead of ¼ inch; the lid is 1/16 instead of ⅛ inch; and there is a turned-down lip around the entire lid. The changes reduce the weight of the cap about 20 per cent, according to the company, and reduce the strain on the hinge assembly.



The new and improved Weathercap exhaust protector features an extra-heavy hinge assembly. The cap will close when leaning at any position more than 30 degrees from the vertical.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 106.

Literature on Blades

Literature describing blades for all types of construction and maintenance equipment is available from the Shunk Mfg. Co., Bucyrus, Ohio. Circulars punched for loose-leaf insertion describe and illustrate moldboards, drag blades, grader blades, bucket lips, scarifier teeth, maintainer blades, snowplow blades, bulldozer blades, and ice scarifier blades. The blades are available in high or low-carbon steels, soft-center, heat-treated, or special high-manganese steels.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 128.

West-Coast Manager Dies

Frank E. Kemp of Los Angeles, long associated with the construction field, died recently. He was District Sales Manager in the Pacific coast area for The Foote Co., Inc., of Nunda, N.Y., subsidiary of Blaw-Knox Co.

BULLDOZERS & TRAILBUILDERS
RIPPERS
TAMPERS
LOADERS
SOUTHWEST Construction Equipment
for every job!
QUICK SHIFT ROOTERS
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DUMP BODIES
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Southwest's complete, standardized line affords construction men an opportunity to fill their needs from one dependable source. From start to finish, no matter whether Allis-Chalmers, Caterpillar, International or Cletrac tractors are used, an economical Southwest unit is available to bring you increased profits.
In addition to the standard line, special Southwest Dump Wagons, Tampers, Heavy Duty Compaction Units, etc., are giving outstanding performance on out-of-the-ordinary jobs all over the country . . . Why not let Southwest help solve YOUR problems?
CONSTRUCTION MACHINERY DIVISION
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ALHAMBRA, CALIFORNIA

For Over 70 Years Builders of Fine WHEEL BARROWS:
AMERICAN
STEEL SCRAPER CO.
Sidney, Ohio

Concrete Viaduct Job Shows Good Progress

(*Continued from page 3*)

ber permitted the piledriver to move about without too much effort, and these skids were kept greased with way grease. Slideover lines, reeved through four-way blocks, were fastened to the ends of the skid timbers. Back-up and come-ahead lines were also fastened to these timbers, and the pile driver crew never dug deadman holes.

Since many of the H-beams are battered by as much as 1 on 3, the leads had to be spotted and slanted many times during a shift. The leads could be battered either by booming over, or by pulling the leads base to its location with a line from a truck at the site.

The steel pile sections, most of which are Carnegie-Illinois 12-inch pieces, were started off according to survey stakes which marked the location of each pile. If a pile section drove in to ground level, the hammer was raised and another piece spliced on. The overburden here contained the ancient remnants of a stream bed, and there was everything in it from clay seams to big boulders. In driving the piles for one bent, one pile 184 feet long was necessary. Only 7 feet away the next pile came to rest in 100 feet of penetration. Within 10 feet of that spot, another H-beam had apparently come to refusal at 110 feet, but it suddenly broke through a large boulder and went another 23 feet before it developed its 65-ton bearing value.

Fleetweld rod was used throughout for the splices, and welding consisted of a stringer bead topped by four filler beads.

Part of the good progress was due to rivalry between the piledriving gang with other men on the different parts of the work. Concrete men threatened to cover the piledriver crew by Saturday night. When they failed—as they always did because the piledriver crew stayed so far ahead—the piledriver men had the last laugh. Usually it was a profane laugh, as befits the dignity of these experienced artisans.

Fine Grading: The piledriver had hardly left a finished bent of piles before men were ready to perform the next operation. A small 4-man crew did the next job, which consisted of fine-grading the ground around the piles, pumping out any seep water, and installing the wood forms which held the foundation concrete.

This was mostly hand work, but it was handled as speedily as possible to reduce to a minimum the time lag between piledriving and concrete work. Foundation forms were prefabricated in a central carpenter shop, where all the lumber and power tools were located. Hauled to the sites of bents by truck, it took less than two hours to install the forms and get the site ready for the next step.

Forms and Concrete: Concrete for the footings contained Incor high-early-strength cement to develop as much strength as possible in the shortest time. Red D Mix Concrete Co. and the Stewart Sand & Material Co. of Kansas City furnished and mixed the concrete.

Footing concrete was either placed directly from the truck-mixers which hauled it, or was transferred to a 1-yard Insley concrete bucket and swung to the pour by a Lorain ¾-yard Moto-Crane. The concrete crew, composed of specially trained men, numbered only 7 men. They could place about 160 cubic yards in 8 hours.

The footing forms were stripped the day after they were poured, and transferred ahead. Carpenters moved quickly in, and plywood lined forms were set up to mold the column pour. These forms consisted of ¾-inch plywood lining, with 2 x 4 or 2 x 6 studs and wales.

A scheme ordinarily used in building construction now made its appearance: the securing of column forms by patented steel snap ties and rods. Superior snap ties and miscellaneous other Superior equipment were used throughout, and there were none of the usual cones, wing nuts and form rods normally found on this kind of work. Snap ties were used successfully on one heavy pour 10½ feet square, and there was no sag or buckling.

"Use of this equipment is a little more costly than what conventional bridge builders use, but it hurries up the work more than enough to justify it," Dunn explained.

Another innovation used here to excellent advantage, while not new, paid big dividends in speed. The steel reinforcing mats for columns and beams were made up according to plan by a small steel crew working on the ground, and then without interference to the carpenters they were raised to place by a Lorain Moto-Crane rented from Belger Cartage Service. It took less men working on the ground to do the same work, the work was safer, and carpenters could work on a bent practically without interruption from the steel men.

Columns at the center of each bent are separated by a 1-inch rubber expansion joint filler, so two pours were necessary. The expansion continuity, incidentally, is maintained throughout the viaduct, and it consists really of two structures one alongside the other, separated by the 1-inch rubber material.

A false bulkhead was used to hold the rubber expansion material in place. Copper wires protruding from the rubber material reached into the new concrete as it was placed, permitting the false bulkhead to be removed next day and the other pour made to complete the 5-column bent.

White vibrators with vibrating tubes up to 28 feet long were used to consolidate the concrete in the tall column pours. The columns were also stripped the day following the concrete work, and Tapco concrete curing compound was sprayed on to keep the concrete surface watertight and assure curing.

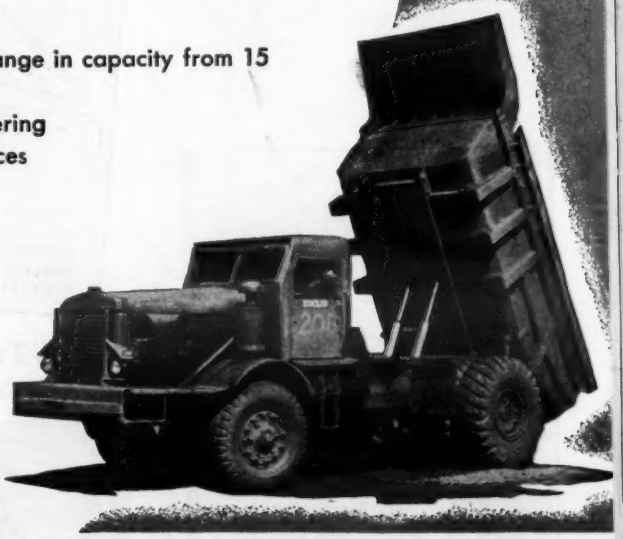
(*Concluded on next page*)

SPRING MOUNTED REAR-DUMP EUCLIDS

This new line of spring mounted Rear-Dump Euclids is designed for greater speed and stability on the haul road and long life in off-the-highway service. Heavy leaf springs are free floating in spring brackets to assure smooth riding and prevent breakage caused by twisting action on rough roads. Axles are positioned to the frame by longitudinal radius rods.

Rear-Dump Euclids with spring mounted drive axles range in capacity from 15 to 34 tons . . . diesel engines to 380 horsepower . . . and have travel speeds up to 32.2 m.p.h. Hydraulic booster steering assures positive control over all road conditions and reduces driver effort on sharp turns and rough hauls.

Built to the same high standards of construction and design that have made "Eucs" the favorite for tough hauling jobs, these improved models provide outstanding performance and lowest cost per ton or yard moved. Your Euclid distributor will be glad to show you how Euclid equipment can help cut your hauling costs and make more profit for you.



The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLIDS

Concrete Viaduct Job Shows Good Progress

(Continued from preceding page)

Safway tubular steel scaffolding material was used successfully to support the weight of reinforced-concrete beams during the pour. The base of the scaffold material rested on two steel H-beams, supported in turn by cribbing. With the exception of a few cross ties between the members, all parts are standard. The patented scaffolding is simple and easy to erect and tear down and it does the work. All this was consistent with the method of construction, which featured speed and efficiency.

The beam pours were made in the same way and with the same equipment as the column pours, transferring the mixed concrete to the forms via the Insley bucket and Lorain Moto-Crane. The side forms were stripped next day, but the tubular scaffold work and the bottom form stayed in place 7 days before inspectors would permit it to be stripped.

Throughout the job, from its start on January 3 this year, the speedy assembly line of effort was stressed. Its results are plain, for the job stayed well ahead of schedule and by November 1 the Dunn contract was finished.

Personnel

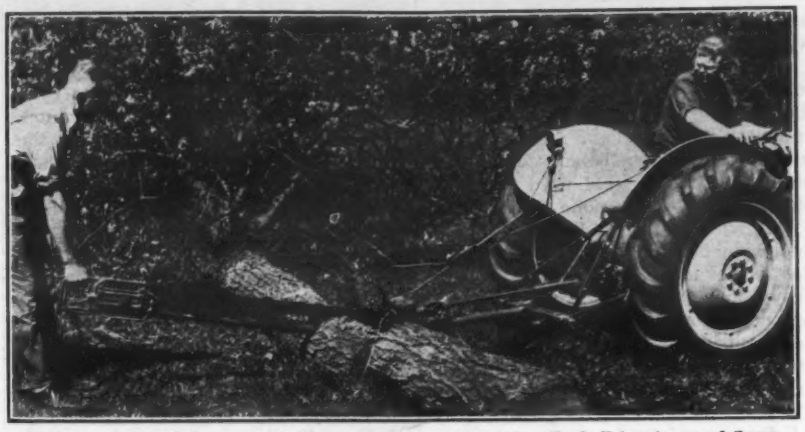
Design of the Southwest Trafficway Viaduct was made by Howard, Needles, Tammer & Bergendoff, Consulting Engineers of New York and Kansas City, in cooperation with engineers of the Missouri State Highway Department. Carl W. Brown, Chief Engineer for the Highway Department, exercised general supervision over the project, with J. J. Corbett as Engineer of Construction and H. S. Jordan, Project Engineer, directly in charge.

For J. E. Dunn Construction Co., J. E. Dunn, Jr. was General Superintendent, assisted by R. L. Thompson, Jr., and John W. Randolph. Bob Long was in charge of steel reinforcing work, and piledriving was under the supervision of Rabbit Dietz.

Tractor-Powered Saw

Designed to fit the power take-off of all tractors and Jeeps, a new chain saw made by the Von Ruden Mfg. Co. of Claremont, Minn., notches, fells, and bucks, and can be used to cut either 4-foot logs or small tree limbs. It will operate in a vertical, horizontal, or angular position; cut at ground level; handle fallen logs; and swing into position without belts or pulleys to catch on brush.

The Von Ruden saw is guided by the easy-grip handle. The tractor or Jeep is said to carry the weight of the saw, eliminating all chain thrust. Weighing 106 pounds, the saw has an automatic hook-up and locks in place for transporting.



The Von Ruden chain saw is designed to fit the power take-off of all tractors and Jeeps. It will operate in a vertical, horizontal, or angular position.

A special safety clutch on the saw protects both saw and operator, the manufacturer says. If the saw is pinched, the adjustable safety clutch releases the mechanism. If the saw encounters an obstruction, it is released before damage can occur. The company states that the special design assures ample sawdust-carrying capacity.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 43.

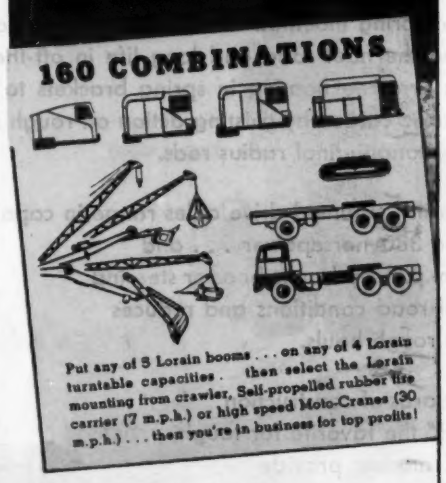
New Lubrication Guide

A new lubrication guide for tractors, trucks, and road equipment has been recently issued by the Swan-Finch Oil Corp., 201 N. Wells St., Chicago, Ill. The 14-page publication describes in detail the properties of the nine different Motul lubricants and makes recommendations for their most efficient use.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 66.

Worthington Appointments

John S. Bachman has been appointed Sales Manager of the Ransome Construction Equipment Sales Division of Worthington Pump & Machinery Corp., located at Dunellen, N. J. He succeeds William F. Lockhardt who recently resigned. Mr. Bachman is succeeded as Regional Supervisor of Worthington's Construction Equipment Division by Lloyd L. Brooks, who will have his headquarters in Washington, D. C.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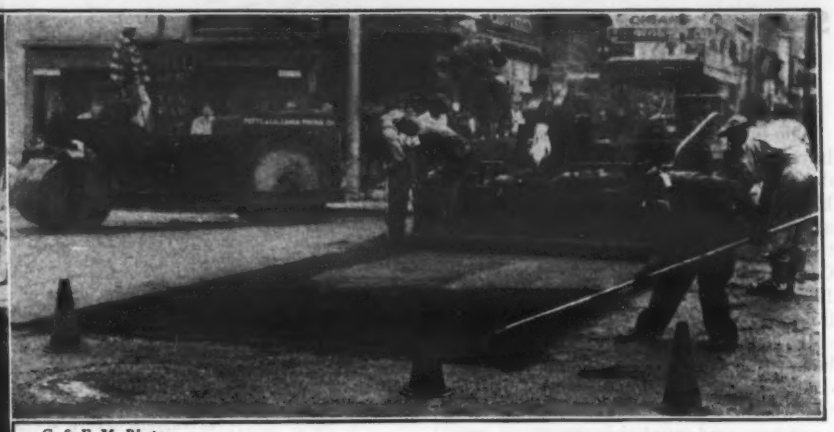

C. & E. M. Photos

The Barber-Greene Finisher and Buffalo-Springfield roller at left were part of the equipment line-up assembled by seven contractors for their Sunday bituminous resurfacing job on Baltimore's main business street. Spots where hand work was required around manholes—photo above—were marked off by Trafficones.

Seven Companies Pave 14 Blocks in One Day

Bituminous Contractors Team Up for Sunday Job on Baltimore's Main Street Through Business District

By MICHAEL A. SPRONCK,
Assistant Editor

✦ SEVEN bituminous contractors teamed up to pave 14 city blocks through Baltimore's central business district in one day—Sunday, October 16. Approximately 25,000 square yards of existing roadway was surfaced with 1 inch of asphaltic binder and 1 inch of sheet-asphalt topping between 5:30 a. m. and 9:30 p. m. This is quite a feat in any man's language, and is probably the first time a 1-mile "main-street" resurfacing job has been completed in one day.

The job, planned by the Bureau of Highways of the City of Baltimore only three weeks prior to completion, was made possible by the complete cooperation of all agencies and groups concerned. The contractors turned out with over 100 pieces of equipment and 365 men for the work. The Baltimore Transit Co. diverted 11 of its vehicle lines that travel along or across Baltimore Street. The Police Department detailed 200 special patrolmen to direct and control traffic which is normally above 18,000 vehicles per day along the stretch of road paved. Businessmen endorsed the Sunday work as a method of preventing the usual sales loss when work is done on weekdays.

Seven Contractors

P. Flanigan & Sons, Inc., was the general contractor for the job, which is part of a $150,000 contract for city street resurfacing. But the firm sublet 12 of the 14 blocks to six other contractors in order to get the job done quickly and avoid dislocating traffic in the downtown area on weekdays. Other contractors, each of whom had a two-block strip, included The National Paving & Contracting Co., Baltimore Asphalt Block & Tile Co., Mahoney Brothers Co., Potts & Callahan Paving Co., Inc., American Paving & Contracting Co., and Arundel Construction Co., Inc.

Paving was inspected by a team of officials from the Bureau of Highways. James H. McKay, Highway Engineer; his deputy, W. L. Chilcote; G. Victor Walters, General Superintendent of Bituminous Construction; and other specialists were on hand to insure that the work conformed to city specifications.

Structures Raised

The work of raising the structures and patching the subsurface and curbing was started a week prior to the surfacing. Over 500 manholes had to be raised, in addition to trolley tracks crossing and, at one point, running for a block along Baltimore Street. High-early-strength portland cement was used for the manholes and for grouting subsurface cavities. About 100 cubic yards was placed around structures and 150 cubic yards to correct base failures. The base is 7-inch concrete, 1½-inch binder, and 1½-inch topping.

The chief traffic problem occurred during this week. Bus and auto traffic was very heavy, but there were no accidents, and only a few of the structures were knocked out of line by vehicles crashing the barricades and running over the tops.

Equipment and Men

The estimated value of equipment used for the paving job was over $2,500,000. This included 7 dual asphalt plants, one owned by each contractor. Twenty-eight trucks were used to haul materials to the plants; an additional 55 hauled the asphalt to the paving site.

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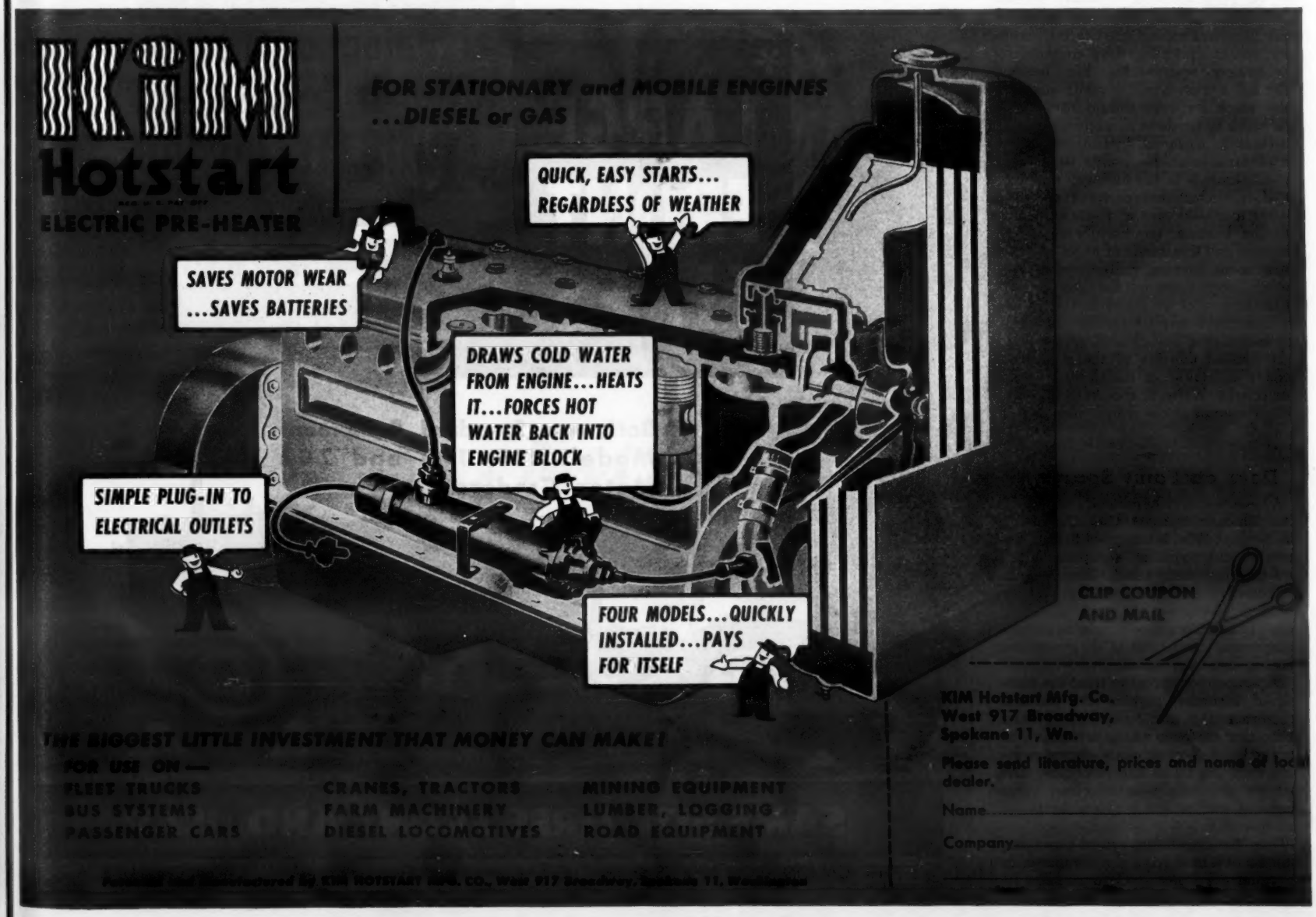


Seven Contractors Pave 14 Blocks in Day

(*Continued from preceding page*)

The large number of manholes played havoc with machine paving, and a good deal of it required hand finishing. Except where hand work was required around manholes and trolley tracks, the trucks dumped directly into 8 Barber-Greene finishing machines set to lay in 10-foot strips. A dozen Buffalo-Springfield and a couple of Galion and Huber rollers ranging from 10 to 14 tons moved back and forth behind the finishers, compacting the new pavement. In addition to the superintendents, equipment operators, and truck drivers, there were 236 laborers, 152 on the site and 84 at the plants.

A 1-inch blinder, composed of ¾-inch-maximum stone and asphalt cement with 70 to 85 penetration, was spread over the old pavement which had previously been given a tack coat of asphalt emulsion. The binder and the 1-inch sheet-asphalt topping were placed in four 10-foot strips. The materials delivered from the plants to the street had a temperature range of 275 to 350 degrees F.

1949 Views on Highway Engineering as a Career

What do junior students in our civil-engineering schools think about highway engineering as a career? What advice on the subject do they get from their professors? The American Association of State Highway Officials conducted a national essay contest in 1949 to get some answers to these questions, and it has recently published the prize-winning and honorable-mention papers in a pamphlet.

"The best highways have not yet been built, and I want to help build them," writes student winner Michael Lash, Jr., of Tufts College. Faculty winner Emmet H. Karrer, Professor of Highway Engineering at Ohio State University, writes that a highway engineer by no means spends his life looking through a surveyor's transit; students who think he does should investigate the work to be done in highway structures, soils, mapping, hydraulics, traffic, or construction. He points to the accomplishments of the highway engineer to date—urban expressways carrying 30,000 to 50,000 cars and trucks a day, "daring bridges, mountain side roads, tunnels, and thousands of miles of ordinary roads serving millions of people daily. Even more outstanding accomplishments will be made in the future by those who select highway engineering as a career".

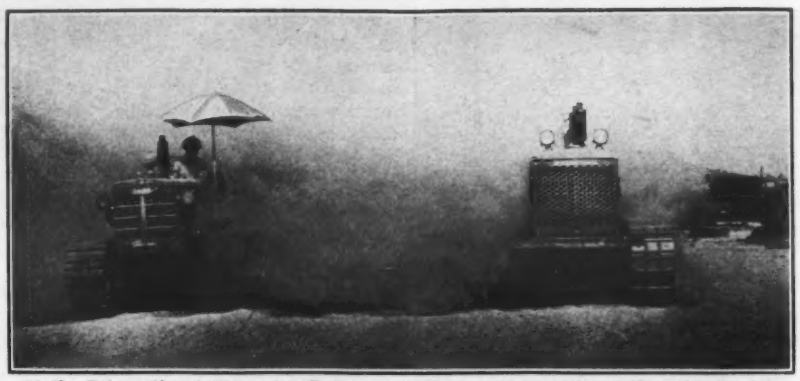
A limited number of the pamphlets remain available for distribution without charge. Write to the Association at 1220 National Press Bldg., Washington 4, D. C.

Data on Paint Spraying

A paint-spray handbook issued by The Electric Sprayit Co., Dept. 901, Sheboygan, Wis., is designed to help determine the type of equipment best suited to the job at hand. This 24-page pocket-size booklet provides tips on sprayers, compressors, guns, and nozzles. In addition, it tells how to service compressors and how to diagnose and remedy common failures.

Directions for spraying treat the mixing of material, making the pattern, triggering the gun, overlapping, and protecting surfaces which are not to be sprayed. A 3-page chart shows common spraying faults and remedies. The last section tells how to clean paint sprayers and provides safety hints for the operator.

This handbook on paint spraying may be obtained from the company, or by using the Request Card at page 16. Circle No. 59.



At the International Harvester Co.'s new testing grounds south of Phoenix, tractors plow through clouds of dust for hours, so that the effectiveness of air cleaners during extremely severe operations can be analyzed.

Test Site for Trucks And Power Equipment

As a testing ground for its motor trucks and industrial power equipment, International Harvester Co., Chicago, Ill., has developed a 4,000-acre tract of land about 23 miles south of Phoenix, Ariz., in the foothills of the Salt River Mountains. Roadways built throughout the area will serve for motor-truck testing, and two headquarters buildings have been constructed—one for motor-truck personnel and one for industrial-power personnel.

The area, leased from the Arizona State Land Department, has been used since 1946 for testing power equipment. J. A. Wesson will continue to supervise that testing project, while John H. Smethers has been appointed Product Development Field Engineer in charge of the Phoenix motor-truck-testing project.

Data on Ice Control With Calcium Chloride

A 26-page manual on the use of calcium chloride for the treatment of ice-control abrasives is available from the Calcium Chloride Association, Ring Bldg., Washington 6, D. C. It recommends procedures for treating, storing, and spreading abrasives which have been coated with calcium chloride. It explains the properties of, the melting action of, and the specifications for calcium chloride. It also includes special field skid-testing data.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 42.

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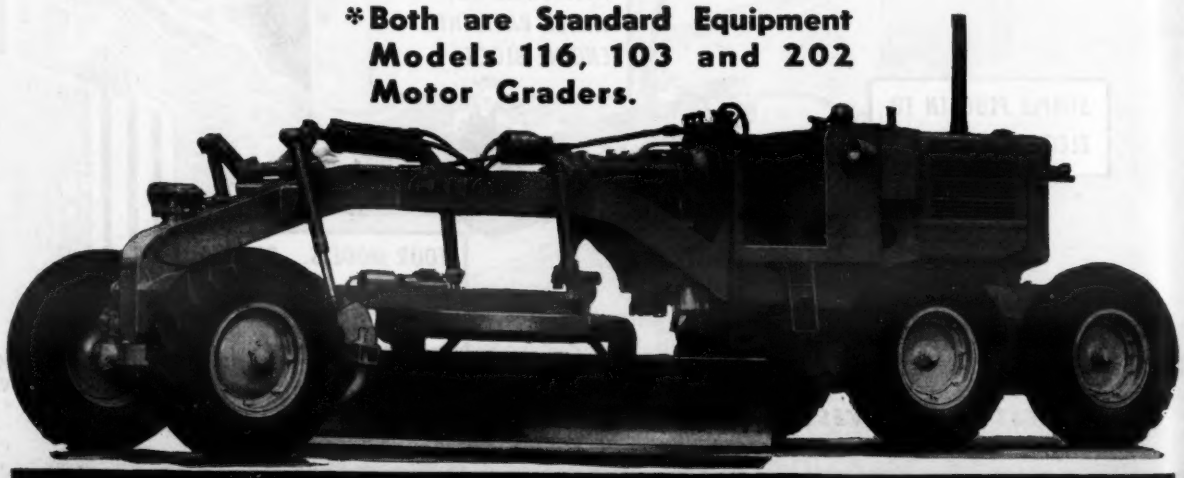

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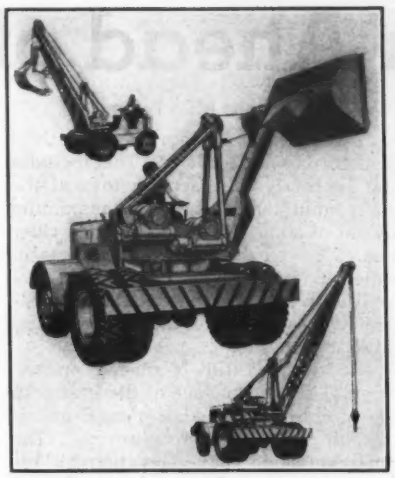
THE GALION IRON WORKS & MFG. CO., General and Export Offices — Galion, Ohio, U. S. A.
Cable address: GALIONIRON, Galion, Ohio

Latest Swing Loader

The new Mandt swing loader, featuring full hydraulic operation, 180-degree swing, and quick-change convertibility to mobile crane or backhoe, is now in production by The Mandt Mfg. Co., 490 W. Goodale St., Columbus 8, Ohio. The unit is designed for a standard ¾-yard material bucket and can load from any point in a 10-foot-wide swath, the company says. It can also load above grade and swing 90 degrees to either side to dump, permitting work within 2 feet of trucks. The main weight of the machine and all the leverage of its load are centered on the 4 driven front wheels for maximum traction and crowding power. The bucket is provided with power dump and return.

The loader may be converted to an excavator and trencher by installation of a ⅓-yard backhoe attachment, or to a mobile 3-ton crane with an operating boom of 10 to 23 feet long which can be swung 180 degrees without outriggers, according to the manufacturer. Traction speeds range from low-low gear for digging to 15 mph for yard crane work and self-transportation over roads and city streets.



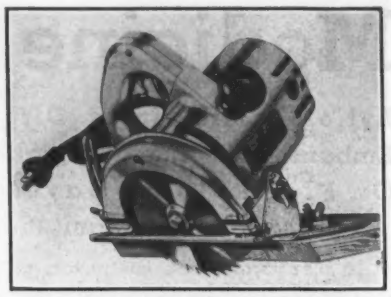
The Mandt swing loader is convertible to mobile crane or backhoe.

All loading operations are powered by standard hydraulic motors and pumps. The hydraulic boom hoist, with automatic safety brake, operates independently of hoist cable and is designed to lower under power. The operator has a choice of both gravity and power control on hoisting and topping for crane work. Hydraulic rams, which power the turntable, limit the radius of swing at 90 degrees on either side. Either gasoline or diesel power can be furnished.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 138.

A New 6-Inch Saw

A new portable electric saw designed to cut metal, asbestos, concrete, stone, and tile, has been introduced by the Milwaukee Electric Tool Corp., 5316 W. State St., Milwaukee Wis. Known as the Milwaukee Silver Anniversary Model 660, this 6-inch saw has a 1-hp motor, weighs 11 pounds, and is balanced for one-hand operation. It is equipped throughout with ball and roller bearings.



The Milwaukee Silver Anniversary Model 660 electric saw cuts metal, asbestos, concrete, stone, and tile.

Features of the saw include a depth gage; a rip guide; a mitering adjustment, from 0 to 45 degrees, with a bevel cut of 1⅜ inches; and a detachable shoe for easier and more economical replacement if damaged. The saw uses grease lubricants to eliminate oil leakage.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 56.

Fireproofing of Steel

"It is possible to build structures of lighter weight, greater usable space, superior fire resistance, and lower cost through the use of lightweight aggregate plaster on metal lath for partitions and for fireproofing of structural-steel members," according to the Metal Lath Manufacturers Association, 636 Engineers Building, Cleveland, Ohio. The point is emphasized editorially in the current issue of "Metal Lath News", a picture-style magazine published periodically by the Association.

Supplementing its editorial, the magazine presents illustrated articles on seven commercial buildings erected since World War II. Each construction case history points out how lightweight aggregate-gypsum plaster (vermiculite or perlite) applied over metal lath was used to fireproof structural steel and reduce dead weight and total building costs.

In addition, data are given on the development of the 1½-inch solid partition designed and developed by the Association for construction or modernization of office buildings, hotels, hospitals, multiple-unit apartments, schools, and other public buildings. Weighing 5 pounds per square foot, this partition is the lightest and thinnest developed to date that qualifies for a one-hour fire-resistive rating, according to the Association.

The magazine includes a tabulation of fire-resistance ratings using metal lath and lightweight aggregate-gypsum plaster for protecting steel columns, beams, girders and trusses, floor assemblies, and roof assemblies.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 68.

Concrete-Machine Line

Literature on a line of concrete-products equipment is available from The Gene Olsen Corp., 401 Grace St., Adrian, Mich. Marketed under the name Gocorp, the line includes block machines, batch mixers, continuous mixers, tile and pipe machines, and a testing machine.

The circulars point out all features and specifications for the Gocorp automatic hydraulic-type block machines, available in models which turn out 24, 12, and 8 blocks per minute. The tile and pipe machines make all sizes through 24-inch diameter. The batch mixer comes in five standard sizes. Gocorp also offers a complete line of improved repair parts and attachments for concrete-products equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 38.

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Medicine Creek Dam Ahead of Schedule

Lytle & Amis Hurry Dirt Embankment; Lucky Break On Flash Floods Saves Diversion Cofferdam

By RAYMOND P. DAY,
Western Editor

✦ IN a burst of speed, contractors on the new $5,115,000 Medicine Creek Dam near Cambridge, Nebr., have moved well ahead of their construction schedule. The earthfill structure, which normally would be expected to drag along at a slower pace because of its size, is being pushed rapidly by C. F. Lytle Co. of Sioux City, Iowa, and Amis Construction Co. of Oklahoma City, Okla., joint contractors.

Started March 3, 1948, the U. S. Bureau of Reclamation contract had 1,350 calendar days to run. But Lytle & Amis are now moving so rapidly that all major items are expected to be finished up this month, almost 2 years ahead of the scheduled date.

Moving earthfill from the borrow pits at the rate of 20,000 cubic yards a day, the great fleet of equipment has created a huge embankment in a short time. Concrete machines have been working behind an earth-rock cofferdam barrier to build the spillway. Flashy, treacherous Medicine Creek has leaped up several times to stop the work—once with a 37,000-cfs flood that crested below the cofferdam by a matter of inches—but each time men and their equipment have moved out of the way temporarily, only to return to the job with renewed vigor.

Designed principally as a flood control measure, a sizable portion of the 93,000 acre-foot reservoir will be used for irrigation purposes. It will be released as a supplement to Republican River flows downstream, to water thirsty acres in the Bureau's Frenchman-Cambridge Reclamation Project.

A Euclid loader drawn by a Caterpillar D8 tractor loads a Euclid bottom-dump wagon with embankment material for Medicine Creek Dam. An empty "Euc" turns in just behind.

Here the loaded Euclid roars out of the borrow pit and heads for the fill. Lytle & Amis used 26 of these hauling units on the job.

Dam a Mile Long

Medicine Creek Dam is an earthfill structure 5,665 feet long. This includes the southerly dike section toward the right abutment. It has a maximum height of about 115 feet above the river bed. The earthfill portion consists of rolled clay, silt, sand and gravel, covered with selected materials from necessary excavations on the upstream and downstream slopes.

The dumped fill is placed on the original ground surface at the upstream toe of the dam, and on a sand-gravel blanket on the downstream toe. The upstream slope above elevation 2,335 is covered with a layer of gravel, and protected with a 3-foot layer of rock riprap. The placement of these materials demonstrated the versatility of the bulldozer to a marked degree.

The downstream slope of the dam is protected from erosion with a 12-inch-thick blanket of gravel.

The spillway on the left abutment is an open channel concrete structure with a highway bridge across its top at the crest of the dam. The spillway is 229 feet wide at the bridge. Designed originally with steel radial gates, for a controlled spillway crest, costs prohibited its construction. Gates were discarded, and an open type spillway was substituted.

Between the two center piers of the spillway as now designed is a slot 13 feet wide and 20.1 feet deep. The elevation of the bottom of this slot is 2366.1, which is the normal water surface of the reservoir. The elevation of the top of the slot is 2386.2, which is the spillway crest and also the top of the flood storage pool. When the flood storage space of the reservoir is full, only 4,000 cfs of water may pass through the slot. This much water will stay within the creek banks and not flood the valley bottom land below the dam. The 20-foot depth of flood storage in the reservoir will accommodate 53,000 acre-feet of water.

A record flood, which occurred on June 22, 1947, and helped to speed construction appropriations, produced 44,000 acre-feet, considerably less than the flood storage capacity of the reservoir.

The drainage area controlled by the dam contains approximately 656 square miles. The reservoir will have a maximum total capacity of 150,000 acre-feet to the maximum high-water elevation of 2408.9. Of this the 93,000 acre-feet storage capacity between streambed elevation (2300) and the lip of the main spillway (2386.2) is allocated as follows: 15,000 acre-feet for silt retention; 25,000 acre-feet for irrigation storage; and 53,000 acre-feet for flood control. The remaining 57,000 acre-feet between the spillway lip and maximum water surface will be temporary flood super storage.

C. & E. M. Photos

The reservoir, when filled to normal capacity, will be 66 feet deep at the dam, 8½ miles long, and will have a shore line of 31 miles. Even at its lowest stage, the lake will be 4½ miles long, so it should be a wonderful place for fishing, boating and duck hunting.

The outlet works, independent of the spillway, is a concrete tube or tunnel 8 feet in diameter and 563 feet long. Buried deep under the dam, about halfway along the tunnel, there is a dome-like gate chamber where the emergency gate is located; 310 linear feet of 44-inch steel pipe leads to another similar gate at the outlet end of the tube. These gates will control the flow of Medicine Creek below the dam.

During the irrigating season in summer, water will be discharged through the outlet works to meet the requirements of water users under the Cambridge Canal. Water stored in Medicine Creek Reservoir will be discharged into the same old channel and diverted into the canal at the Cambridge Diversion Dam on the Republican River 2 miles east of Cambridge. Water stored in Medicine Creek Reservoir will irrigate about 18,000 acres under the Cambridge Canal.

The land in the reservoir area is rich in archeological treasure. Bones of mastodons, sabre-toothed tigers and many other prehistoric animals have been found by the University of Nebraska and the Smithsonian Institution. The presence of cultured Indian tribes, who lived here 500 years ago and were not visited by white men, has also been established.

Classed only as the "Upper Republican Peoples", these Indians lived above the flood line. They hunted bison, deer and antelope. They raised corn, beans, and squash, and used bison bones for hoes and shovels. Bone fishhooks and thousands of fresh-water clam shells indicate another source of food.

It is a significant commentary on the history of flood control and its need that the early white settlers in this vicinity made a study of Medicine Creek; its characteristics, velocity, and other properties. When the white men first came, it was normally a placid stream, and small dams were erected to grind grain into flour. As soon as large-scale land clearing began, so did the riot of waters. The mills which used the waters at Cambridge noticed the increase in speed at once.

Prior to the destruction of the trees, undergrowth and sod it required 2 days for the river rise to come down from Stockville to the Cambridge mills.

(*Continued on page 22*)

As the material pours into the fill, it is spread in 10-inch lifts by bulldozers and blended with moisture by Rome disks (photo above). Then a Gebhard tamping roller pulled by an International TD-24 and ballasted to weigh 48,000 pounds compacts the fill to 6-inch lifts (photo right, above). There were two of these units on the job.

In the quarry (photo above) a Koehring 605 shovel loads a Euclid end-dump with blasted rock to be processed, then used as riprap. At the Cedarapids crushing plant 1,500 feet away, a Euclid waits to dump rock to the feeder, while an Athey wagon and another Euclid wait for a load of riprap (photo above).

Medicine Creek Dam Face Protected from Erosion By Riprap and Gravel; Equipment Places Rock

ONE of the usual things about central-Nebraska construction work is the fact that rock is hard to find. Conversely, one of the unusual things about the Medicine Creek Dam is the fact that nearly 120,000 cubic yards of rock riprap were located only a mile from the dam site.

In Idaho or Montana, perhaps, that would not be news. At Medicine Creek Dam, it is news of first-order importance, because the location of a rock ledge near the south abutment saved a great deal of money. Engineers of the U. S. Bureau of Reclamation had believed the riprap would have to be shipped in.

The fact that the rock supply was available on the project site has perhaps accelerated the production and placement of the material. At any rate, it was put in as the dam embankment went up. Efficiently organized as to location of work, the riprap was spread quite successfully by a D8-mounted Caterpillar bulldozer blade. Its operator is every inch an artist.

The C. F. Lytle Co. of Sioux City and Amis Construction Co. of Oklahoma City have been pushing the rock riprap, along with earthfill, concrete and other items, to finish the 5,665-foot-long dam and dike for the U. S. Bureau of Reclamation. The riprap work on the upstream face of the dam is necessary to prevent damage from wave or rain erosion, when the big flood control-irrigation reservoir fills to its operating level.

Had to Classify Material

The quartzite ledge rock found by USBR exploration parties lies about 30 feet below the surface of the ground, south of the right abutment. Specifications call for an 18-inch blanket of 3-inch-minus crushed material for the first 30 feet of elevation, with rock riprap over the blanket to a depth of 36 inches. The remainder of the dam is protected by a 12-inch rock blanket and 24 inches of riprap. Both the riprap and the crushed blanket course were produced from the single ledge source of rock in that locality.

Thus the work was arranged in this layout: the rock was first broken up and loaded out of the pit, then it was run through a classifying plant and crusher, and the two types of material were sent to the dam where they were both placed by a bulldozer.

Timken steel and Timken bits were used on three wagon drills: an Ingersoll-Rand, a Worthington and a Chicago Pneumatic. Shallow 8-foot holes were put down on centers seldom over 5 feet, and loaded with Hercules 40 per cent extra strength gelatin. Oversize rocks were drilled with several Jackhamers. An Ingersoll-Rand portable and a large Chicago Pneumatic 500 cfm air compressor furnished the power for the drills.

Drilling was not too difficult, although the rock was somewhat abrasive. Some of the stone was also brittle, which helped the high explosives to break it down to small size.

Blasted rock was handled by a Koehring 605 power shovel, which loaded the material to 5 Euclid end-dump trucks. These machines had an approximate 1,500 foot haul to the crushing plant. An elevated earth ramp over the primary hopper let them dump their loads direct.

As the blasted rock dumped by gravity into a large Cedarapids receiving hopper, a Cedarapids feeder took over and moved the material out where it passed over a 5 x 8-foot vibrating grizzly deck. The feeder and the grizzly were both powered by electric motors, which took their power from the main camp generating supply.

The grizzly rails were set with a clear space of 3 inches. Rocks larger than this were retained, and slid down a chute into the machines which transported the riprap to the dam. These machines included 4 Athey wagons pulled by Caterpillar DW10's, and one end dump Euclid truck. They drove straight through under the chute and came out of the pit without backing up.

Material passing through the grizzly passed over a 30-inch belt-type conveyor to a double-deck vibrating screen on a Cedarapids rock plant. The top deck of this screen had 3½-inch mesh, while the bottom deck had 1-inch squares.

Oversize material retained on the top deck passed through a 24 x 36 jaw crusher, and out a stacker conveyor to a 20-ton surge bin. Troughs from the 1-inch lower screen went out to a waste pile, where they were pushed to one side by a D8 Caterpillar dozer. Material retained on the 1-inch deck joined the jaw crusher troughs, and went to the surge bin. This made the material for the gravel blanket.

Two Euclids hauled the gravel blanket material out to the dam, where it was dumped at the end of the dirt fill and spread downhill by a D8 bulldozer.

How Work was Organized

In order to have a place for the hauling wagons to dump all the time, and also a place for the bulldozer to work, the rock-facing operation had to be synchronized with the earth work on the main embankment. This was done by taking approximately half the total length of the main fill, and building the impervious zone material ahead, leaving the upstream pervious zone at a lower level. Work on the impervious zone continued until it was about 15 feet above the incomplete pervious zone.

At the other half of the embankment, however, the pervious zone was being constructed. While this work was under way, of course, the rock crews were at work where the zone was low. When they finished that portion, they moved down to the other half. Pervious zone equipment, hauling from the Northwest shovel in the spillway excavation and the P&H shovel in the rock borrow pit, then brought up the low fill in a hurry.

This acted to make perhaps 1,000 feet of slope about 25 feet high available at all times to the bulldozer and hauling equipment.

Perched on the dam fill, a D8 dozer, working downhill, spreads a rock blanket to near-perfect grade. Riprap went in the same way.

Gravel Blanket First

The crushed gravel blanket was placed first. The material was dumped at the edge of the fill, and was then spread to grade stakes by a D8 Caterpillar and bulldozer blade. The machine, operating from the berm, spread the material when it went downhill, and back-bladed that spread as it backed up to the berm. The downstream slope is 2½:1, but the machine had no trouble maintaining a near-perfect grade as it worked along.

USBR inspectors and engineers checked the thickness and grade of the gravel blanket occasionally, to make certain the proper thickness was spread.

Riprap was then dumped by the Athey wagons. The heavy rock fell down the slope on the gravel blanket, but very little disturbance occurred. The D8 then crawled out over the riprap and worried the rock into place. The weight and vibration of the machine gave the Bureau of Reclamation a very dense riprap job, and incidentally, a very smooth one. The machine had no difficulty spreading all the equipment could bring out, which often amounted to about 1,500 cubic yards per shift.

Tests made by the Bureau have shown little disturbance to either the riprap or the gravel blanket because of the 20-ton D8 working, and the finished job is true to line and grade. The rock will be left open, and no grouting is contemplated.

The efficient organization of this part of the work, coupled with good equipment and common-sense methods, permitted a small crew to stay up with the dam embankment as it was placed. Had the embankment been built before any rock was spread, the operation would have been much more expensive.

Under the field supervision of General Superintendent George M. Stiers, Lytle & Amis are ahead of their schedule and expect to have all the major items in connection with the dam finished by this month. Medicine Creek Dam is a part of the Bureau of Reclamation's Frenchman-Cambridge irrigation and land development program, and it will help to prevent floods in the Republican River Basin, such as have occurred in the years 1935, 1947, and 1948.

It is estimated that 5,000,000 acre-feet of water have gone to waste on Medicine Creek since white men took their claims in the basin in the 1870's. Today, with earth and concrete and riprap, men are trying to cure that situation forever.

ARBA-AASHO Committee Launches Highway Studies

The American Association of State Highway Officials and the American Road Builders' Association are going to work together on a seven-point program of studies designed to increase efficiency and economy in the highway industry. The program was set up by their Committee on Cooperation during the recent AASHO annual meeting in San Antonio.

The studies will consider (1) the extension of Federal-Aid legislation, the amount of such aid, and its division as to road classification and costs; (2) the relative economy of the contract system compared with day-labor methods; (3) ways and means of reducing overhead and direct costs for secondary roads; (4) methods of improving state-county cooperation; (5) development of construction-machinery specifications; (6) simplification of job specifications to eliminate unnecessary costs; and (7) development of programs to keep the public accurately informed on important highway matters.

C. & E. M. Photos

Service and repairs at Medicine Creek Dam center around the shop and yard at left. Portable lubrication outfits travel around the job servicing equipment—for example, the International TD-24 and its sheepsfoot roller shown above.

Medicine Creek Dam Is Ahead of Schedule

(*Continued from page 20*)

After their destruction, the water came down in 8 hours. The waters which caused the recent serious flood at Cambridge fell at Stockville at 10 p.m. and filled the streets of Cambridge about 6 a.m. the next morning to a depth of 5 feet in the business district.

Thus has Man created his own need for the present construction.

River Diversion

At the time the contractors, Lytle & Amis, moved in, Medicine Creek flowed over near the right abutment. In order to keep the river in its channel and to clear the site of the foundation excavation, a heavy earth cofferdam was built. Excavation in earth, sandstone, and rock produced very heavy material. It was hauled in, dumped, spread, and compacted by the transporting equipment. This cofferdam completely enclosed the cut-off trench site and cleared the deep excavation necessary for the foundation of the earth embankment.

Immediately after the east half of the cut-off trench had been excavated to solid bedrock and backfilling with a select impervious material to a point well above the high water mark had been accomplished, the river was rerouted into a new channel that had been excavated along the upstream side of the cofferdam and adjacent to the left abutment. With the problem of the river solved for the time being, the west half of the cut-off trench was excavated through the original river channel and backfilled, using the same material and equipment that had been employed to complete successfully the first stage of the trench work. At the same time, the outlet tunnel was constructed, along with 30 per cent of the dam embankment and a major portion of the spillway excavation. In order to protect the deep excavation for the spillway stilling basin, it was also necessary to construct a cofferdam along the east side of the new diversion channel and across the previously excavated spillway outlet channel. This cofferdam was used as a haul road from the concrete batch plant to a large part of the spillway-structure area.

The final closure, which was coming near when this was written, was to be accomplished by constructing an earth-rock wing cofferdam from one corner

(*Continued on next page*)

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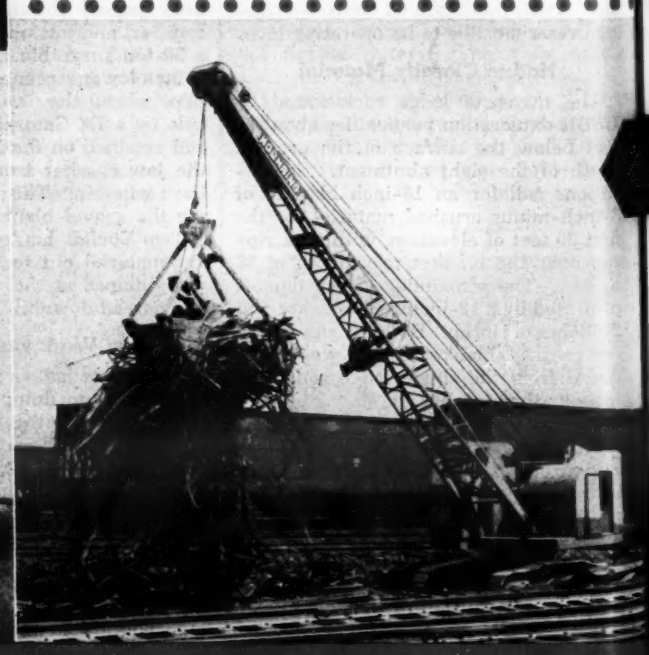

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of the present cofferdam to the completed earth fill. Medicine Creek would then back up, and a small reservoir would build up to the trash rack intake of the outlet structure. The normal flow of the stream would then pass through the outlet works. The remaining plug of earthwork could then be placed, after cleaning up the overburden, excavating, and filling the remainder of the core trench.

A serious flash flood in the early stages of construction work, when a long piece of core trench lay exposed, threw 37,000 cfs down against the cofferdam. It held, and as the water crept higher and higher men and equipment built it up more and more. When the crest was reached, men were still working desperately with inches to spare.

Earthwork Was Hurried

Earthwork started with several excavations. A spillway cut had to be made through yellow chalk and sandstone, and the plans called for a core trench about 65 feet deep. The core trench went down to a solid bedrock formation, which when reached turned out to be dense, good material. The overlying earth and gravel was removed by the machines used on the embankment. As the core trench went deeper and deeper, the water table was soon encountered. Stang wellpoints installed at 20-foot levels on berms on each side of the trench removed the subsurface water, and permitted the excavating machines to continue their work.

The spillway cut was opened up and dug by the same drilling and hauling equipment which developed Zone 2 material and riprap.

The embankment consists of a main impervious zone in the center, flanked upstream and downstream by coarser-run pervious zones. A dumped fill on a gravel blanket at the downstream toe rounds out the zones. In general, the impervious zone was built out of silty loess soil, with some sandy material brought in from the borrow pit where riprap was produced. The pervious zones contain much coarser material, usually gravel, small rock and so on, which was found just over the riprap rock ledge and in the spillway excavation.

The development of a borrow pit over a rock ledge only 5,500 feet from the dam was one of the unusual angles about the job. This part of Nebraska is noted for its scarcity of suitable rock, and early plans had contemplated the shipment of riprap over the railroad as a matter of course. Geological explorations then uncovered the presence of a thick ledge of white Ogallala quartzite rock, lying under about 30 feet of overburden south of the right abutment.

All of the material lying over the rock ledge was used for Zone 2 and Zone 1 fill. A fine 15-foot layer of good loess made excellent material for the impervious zone. Between this good silt and the solid rock there was a layer of almost pure sand. It too was used, much of it in the pervious zones.

Equipment engaged in the removal of overburden at this pit consisted of a P&H 4-yard shovel, which loaded 9 Euclid bottom-dump wagons. Originally built as 13½ cubic-yard rigs, Lytle & Amis put 10-inch sideboards on each vehicle to boost its capacity to about 17 cubic yards. Because of the selectivity of material in this borrow pit, the shovel did a great deal of moving around, especially when loading out material for the impervious zone.

The material hauled out of this pit was sent to the dam, where it was dumped and processed in a uniform manner to be detailed a bit later. The P&H shovel cleaned up the overburden all the way to rock, after which it was then ready for the drillers, powdermen and equipment which produced riprap. Exactly how this unique operation was done is detailed in the companion article on page 21.

Main Borrow Pit a Beehive

The main borrow pit, where most of the earthfill material was produced, was a beehive of activity. It was located within the reservoir area, only 2,500 feet from the dam. It will be covered by water when the reservoir fills behind the dam.

The borrow pit consisted of silty loess soil, fine and deep, extending far down below the ground surface. While there is over 3,000,000 cubic yards in the dam enbankment, there is enough loess in the reservoir area to build many more such structures. The material is dry, easy to dig and tricky to haul.

Equipment in the main pit consisted of one Euclid loader, pulled by a D8 Caterpillar tractor. This machine took care of 10 Euclid bottom-dump wagons, also increased to 17 cubic yards by the addition of 10-inch steel sideboards. Most of the "Eucs" are still stock models, but most of the machines have had their original 150-hp engines replaced by 200-hp Cummins diesels.

The Euclid wagons were loaded in less than a minute by pulling them under the elevating conveyor belt, and filling the back end of the wagon first. The operator simply slowed his throttle a little to let the wagon drop back slowly until the load was completely filled.

It was necessary to wet the borrow pit to handle the material properly, especially during the dry summer weather. An irrigation sprinkler system was purchased in Idaho, and it was used to spray water over the dry material. The water came out of Medicine Creek, and with the exception of a few high places where a small booster had to be used, the pumping was handled by a high pressure 8-inch Gorman-Rupp pump.

Haul roads from the main borrow pit were a source of trouble. The silty material made a beautiful road, and the three Caterpillar No. 12 motor graders maintained it velvet-smooth. But the sun and wind soon dried out any moisture, and then dust became a problem.

Lytle & Amis have 3 large 4,400-gallon tank sprinklers, mounted on Caterpillar DW10's, but over-sprinkling of smooth haul roads soon produced a dangerous, slippery condition. The roads were sprinkled very lightly, therefore; just enough to settle the dust. On the access ramps, where there were grades to encounter, the truck did no sprinkling.

One other equipment set-up completed the earthfill excavation picture. There was a Northwest 80-D shovel, and it usually handled six 17-yard bottom-dump Euclids. It worked at the edge of the main borrow pit, and in the spillway cut. This machine handled comparatively easy material, and turned it out at a high rate of production.

Altogether, the total of 26 Euclid hauling wagons were turning in 20,000 cubic yards of material to the dam fill each day, in the 2 ten-hour shifts they worked.

As the material poured into the fill from three sources, it was processed

(*Concluded on next page*)

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Medicine Creek Dam Is Ahead of Schedule

(*Continued from preceding page*)

and laid down at high density. The material was first spread by a bulldozer blade and a motor grader. One of the sprinkler wagons then added the water necessary to bring the soil content up to about 12-16 per cent. A large storage tank reservoir on the right abutment permitted the water wagons to pick up their loads in a minimum of time.

Two Rome disks, pulled behind TD-18 International tractors, then blended the moisture and earth. Three heavy sets of Gebhard tamping rollers, ballasted to weigh 48,000 pounds, compacted the soil. Two of these gigantic rollers were pulled by International TD-24's, while one was hooked behind an Allis-Chalmers HD-19. The rollers made an average of 12 passes to develop the correct density.

The wind-blown loess material in place in the borrow pit weighs about 80 pounds per cubic foot dry density, but its natural density was increased to approximately 105 pounds per cubic foot by conditioning, blending and tamping. The material went down in 10-inch lifts, which were compacted to 6-inch lifts.

The embankment was built in an interesting manner, to allow room for riprap work to keep up with the earth-fill. The impervious zone was carried about 10 feet higher than the outer pervious zone upstream. This created a ramp, or berm, where riprap hauling units could work. The pervious zone material was then run in very fast, when the rock caught up. As a rule about half the total length of pervious zone material was raised, while the other half was getting its rock blanket.

The proper maintenance and repair of such a vast fleet of excavating equipment is something for which both the Lytle and Amis firms are noted. Service and repairs centered around a large 100 x 60-foot metal shop and yard on the left abutment. Here all kinds of heavy replacement and overhaul jobs were done. Repair consisted of putting in factory-made approved parts, and adjusting the equipment for maximum performance.

Engine lubricating oil was changed every 60-70 operating hours, and each unit got a thorough lubrication once a shift. Two mobile lubricating units made the rounds. There were two Caterpillar diesel-electric sets, one a 119 kw; the other a 150 kw; for furnishing all power needed on the job. That included lighting at night, power for the rock crusher at the riprap pit, etc.

Personnel

Medicine Creek Dam is being directed for Lytle & Amis by big, genial George M. Stiers, General Superintendent. He gets assistance from Harold Cross, in charge of Excavation; Cliff Godsey, Concrete Superintendent; Harold Bullard, Master Mechanic; Guy Strothers, Carpenter Superintendent; and R. Wellington, Electrical Superintendent. Milo Stych is the Job Engineer and Fred Kenney is Office Manager.

For the U. S. Bureau of Reclamation, the field work is under the direction of Acting Construction Engineer W. J. Quinn, who works under H. A. Robinson, District Manager, Indianola, Nebr., and L. N. McClellan, Chief Engineer.

Hard Plastic-Finish Concrete-Form Liner

A concrete-form liner, having the characteristics of the standard GPX plywood for concrete forms, yet flexible enough to be used for curved surfaces, has been developed by the Georgia-Pacific Plywood & Lumber Co., Empire State Bldg., New York 1, N. Y. This new plastic-coated GPX form liner is designed for use in arch-bridge and hangar construction where it will permit using rough boards for strength and still provide almost any degree of curvature in the finished work.

The product is a ⅛-inch fir veneer-surfaced with either 60/60 or 93/93 plastic in natural color. The allowable bending radius of an 8-foot panel of 6 PX form liner is 6 feet, according to the manufacturer. Both sides are coated and may be used a number of times.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 142.

Circulars Describe Hose

A series of circulars which describe various Mulconroy hose specialties and make suggestions for their use are offered by the Mulconroy Co., 54th and Jefferson Sts., Philadelphia 31, Pa. The hose are designed to carry steam, hot and cold water, gas, air, oxyacetylene, tar, and asphalt. Special hose are made to meet special requirements. Flexible all-metal hose, fully interlocked, semi-interlocked, asbestos - packed, reinforced, and plain hose may be obtained. The circulars include descriptions, drawings, photographs, dimensions, and prices for each of the hose types.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 145. Please specify the particular type of hose you are interested in unless you desire to receive the entire series of circulars.

Pioneer Sales Engineer

In the capacity of District Sales Engineer, Fred Dolton now represents Pioneer Engineering Works, of Minneapolis, Minn., in New England, New York, Pennsylvania, New Jersey, Maryland, and Delaware.

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GOOD ROADS MACHINERY CORP. - - - - - - - - - - MINERVA, OHIO

Fire-Protected Steel For Capitol Building

Permalite plaster is being used for fire protection on all of the structural-steel roof supports in both Senate and House Chambers of The Capitol, Washington, D. C. Two carloads of plaster aggregate — 8,000 cubic feet — will be used to complete the job. The aggregate is mixed with gypsum and water to make plaster; no sand is used. Permalite, made from volcanic perlite rock, is manufactured by the Great Lakes Carbon Corp., 18 E. 48th St., New York 17, N. Y.

In the process of fireproofing the structural-steel roof supports, wire lath is tied tightly around the steel. A first or scratch coat of plaster is then applied. After this is dry, a second or brown coat of plaster is applied. The total thickness of the plaster is approximately 1¼ inches. The use of Permalite is said to lower costs because of the weight reduction of both the structural-steel members and the fireproofing material.

The scheduled date for completion of the work is January 1, 1950. Architect for the renovation is David Lynn, Architect of the Capitol Building. General Contractor is the Consolidated Engineering Co., and the plastering contractor is McNulty Brothers.

Further information on Permalite and its uses may be secured from the company. Or use the Request Card at page 16. Circle No. 58.

Folder on Wagon Drills

A 12-page catalog on wagon drills is now available from the Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa. It deals with three sizes of wagon drills: light, medium, and heavyweight. Line drawings show savings in drilling costs for these mobile wagon mountings. The booklet is also illustrated with photographs of various field applications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 2.

Data on Safety Equipment

The 1949-50 issue of "Everything in Safety", a complete catalog of personal protective equipment and industrial safety devices, has just been issued by the E. D. Bullard Co., 275 Eighth St., San Francisco 3, Calif. The catalog is divided into five sections: first aid; respiratory protection; eye protection; hats, belts, and clothing; and miscellaneous safety equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 151.

FREE
NORTHWESTERN AUTO PARTS CO
DEALERS... FLEET OPERATORS!
Our Newest Catalog. Complete with latest accessories and Hard-to-Get parts for ALL CARS AND TRUCKS.
NATION'S HEADQUARTERS
for MILITARY TRUCK PARTS
ALL TYPES
DU-ALL ADAPTERS
DUALS for your trailer, farm wagon, pickup. Adapt to any standard type drop center 15" or 16" wheels as used on passenger cars or pickups 1928 to 1949 models. Use your old spares, attach or remove in 10 minutes. Specify make and model.
AS LOW AS $19.00 per set
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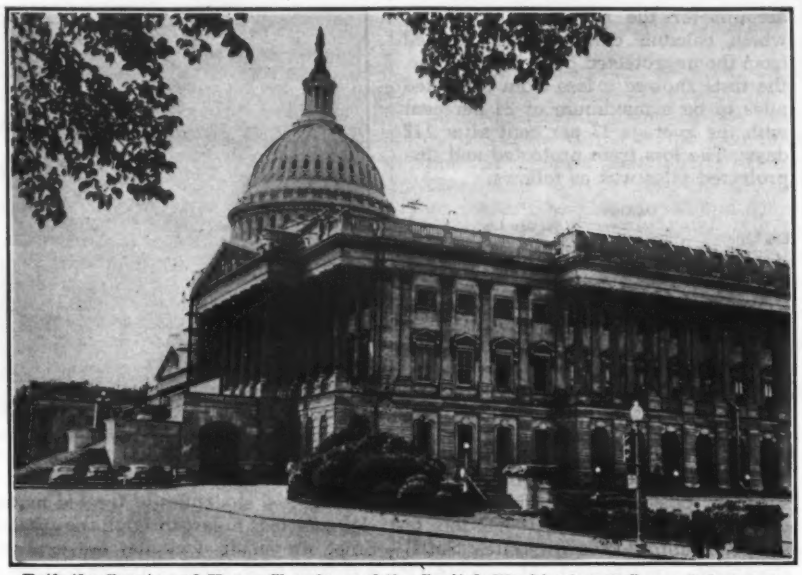


Both the Senate and House Chambers of the Capitol, Washington, D.C., are being completely renovated. New lightweight Permalite plaster is being used to fireproof all of the structural-steel roof supports of both Chambers.

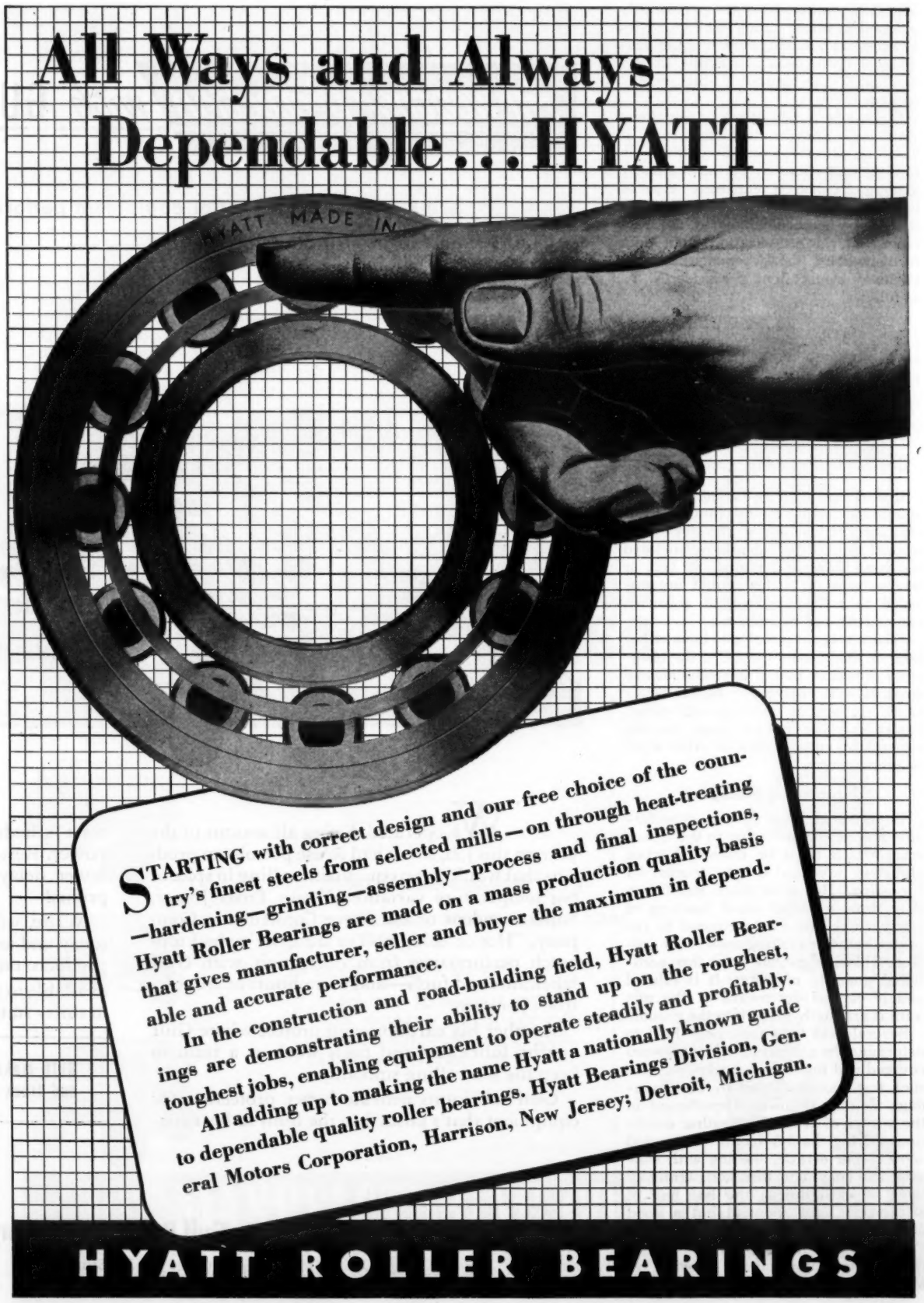
Salisbury Is President Of Air Reduction Sales

H. R. Salisbury, who has been with Air Reduction Sales Co. of New York City for over 23 years in various executive capacities, has been named its President. H. F. Henriques, J. J. Lincoln, Jr., S. B. Stouffer, and N. L. Wisser have been named Vice Presidents.

Leaflet on Anti-Freeze

Publication of a new leaflet on Freez-Rem, an alcohol type of anti-freeze, is announced by Speco, Inc., 7308 Associate Ave., Cleveland 9, Ohio. The leaflet lists Freez-Rem features which, according to the manufacturer, include high boiling point, extra anti-freeze protection, and low cost. A chart showing the quantities of Freez-Rem needed to protect engines at various temperatures is contained in the leaflet.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 4.


All Ways and Always
Dependable...HYATT
HYATT MADE IN
STARTING with correct design and our free choice of the country's finest steels from selected mills—on through heat-treating—hardening—grinding—assembly—process and final inspections, Hyatt Roller Bearings are made on a mass production quality basis that gives manufacturer, seller and buyer the maximum in dependable and accurate performance.
In the construction and road-building field, Hyatt Roller Bearings are demonstrating their ability to stand up on the roughest, toughest jobs, enabling equipment to operate steadily and profitably.
All adding up to making the name Hyatt a nationally known guide to dependable quality roller bearings. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey; Detroit, Michigan.
HYATT ROLLER BEARINGS

Covered Storage Best For Treated Abrasives

Bins, Sheds, or Protected Piles Prevent Loss of Calcium Chloride Through Leaching: Field-Test Data

✦ A CURRENT problem facing the highway engineer is where and how to store abrasives treated with calcium chloride for winter ice control. Covered storage, the Calcium Chloride Association points out, assures unfrozen material. It prevents loss of chemical and makes it unnecessary to treat the abrasives again with flake calcium chloride before applying them on the ice. And where there is only one chemical treatment, it is possible to maintain control over the quantity of chemical used.

Bins, Sheds, Covered Stockpiles

The best method of storing treated abrasives is in covered bins so located that they serve more than one road. Elevated storage bins are particularly adapted to hilly country where gravity handling is possible. However, an economical bin set-up is possible in any location if mechanical loading equipment is used.

Storage bins have these principal advantages: They reduce the cost of handling abrasives and they speed up sanding operations by permitting faster loading of trucks. Comparative costs of bin, crane, and hand loading of abrasives have been calculated by the Calcium Chloride Association from data furnished by the Onondaga County Highway Department, Syracuse, N. Y., as follows:

	From Bins	From Stockpiles	
		By Crane	By Hand
Average loading time in minutes	2½	3½	32
Truck capacity in tons	6	6	6
Truck driver and helper at $2.25 an hour	$.094	$.131	$1.20
Crane and operator at $4 an hour	....	$.200	....
Total loading cost per truck	$.094	$.331	$1.20

If sheds are used instead of bins, they should be sturdily built so that the walls will support the load of abrasives piled against them. They should be enclosed on three sides and roofed. A belt or bucket type of loader should be provided to make handling of abrasives convenient and economical.

Where it is not possible to have either bins or sheds, says the CCA, the abrasives should be placed in stockpiles and covered with heavy tar paper, Sisalkraft, tarpaulins, waterproof paper, empty calcium-chloride bags, canvas, corrugated-metal arches, or other wood or metal covers.

Unprotected Stockpiles

Unprotected piles show a considerable loss of abrasives due to the frozen crust which must be discarded when abrasives are loaded into trucks for spreading. But even more significant, they show a rather rapid leaching of calcium chloride when exposed to repeated rains or melting snow. The calcium chloride cannot hold this additional quantity of water; it is diluted and is carried downward in the pile until it gradually seeps into the ground.

Several field tests have been held to determine the comparative loss between covered and uncovered stockpiles. One such test was conducted by the Onondaga County Highway Department in the winter of 1946-47. Weather conditions during the 3½-month test period were rather erratic, starting with considerable snow and then comparatively light snowfall during the last half of December; light snowfall but a good deal of freezing rain in January; a cold February with much snow; and about three times the normal snowfall in March. These severe conditions may account for the rather rapid rate at which calcium chloride was leached from the unprotected piles. In any case, the tests showed a loss from protected piles to be a maximum of 24 per cent with the average 17 per cent after 112 days. The loss from protected and unprotected piles was as follows:

Stockpile	Original Treatment Lbs./Cu.Yd.	Average Loss of Flake Calcium Chloride		
		1 Month	2 Month	3½ Month
Unprotected				
Cinders	100	24%	48%	70%
Cinders	75	36%	60%	70%
Bank sand	50	30%	70%	75%
Stone screenings	50	34%	80%	90%
Protected (tar-paper covers)				
Cinders	100	18%	24%	24%
Cinders	75	7%	9%	9%
Bank sand	50	10%	22%	16%
Stone screenings	50	18%	20%	20%

While the CCA recommends bins, sheds, or protected stockpiles for storage of treated abrasives, it has this to say about unprotected stockpiles: Small stockpiles, replenished as necessary from a central mixing and distribution center, are more satisfactory than large unprotected stockpiles of treated material sufficient to last through the season. Since the small stockpiles are exposed a shorter time, there is almost no frozen material caused by the leaching and weakening of the chemical treatment.

To prevent leaching of calcium chloride, stockpiles of treated abrasives should be protected with tarpaulins, waterproof paper, canvas, or some other type of cover.

The Calcium Chloride Association also recommends that treated abrasives for stockpiles be mixed at central mixing stations to insure definite control of mixing and quantity of calcium-chloride treatment.

All-weather protection with GULF LUBRICANTS

helps contractor get better equipment performance on tough stripping job . . .

Sager Construction Company, St. Louis, Mo., recently completed the contract to move 800,000 yards of overburden from this clay mine owned by Kentucky-Tennessee Clay Company, Mayfield, Kentucky.

"WE operated during all seasons of the year on this job, so we had to use petroleum products that would keep equipment rolling in spite of big temperature variations," says Troas Joiner, Superintendent of the Sager Construction Company. "Hot or cold, mud or dust, we've had top-notch performance from every unit with Gulf lubricants and fuels—and extra hours of trouble-free operation."

Another big earth-moving project where Gulf quality lubricants and fuels work as a team to keep the job rolling smoothly.

Gulf lubricants provide better protection for equipment that's pushed to the limit to beat contract schedules — and Gulf fuels insure full power. Result: an extra margin of performance, fewer delays, lower maintenance costs, bigger profits!

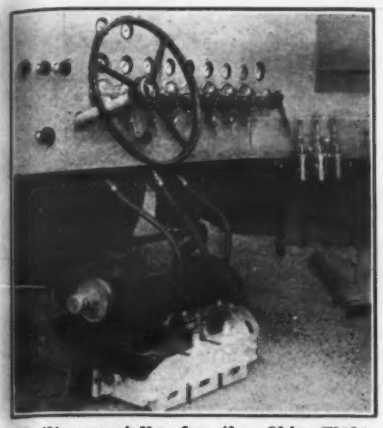
Write, wire, or phone your nearest Gulf office today and arrange to use Gulf quality petroleum products on your operation. They are quickly available to you through 1200 warehouses located in thirty states from Maine to New Mexico.

Gulf makes available top quality passenger and truck tires — ask your Gulf representative

Gulf Oil Corporation · Gulf Refining Company

Offices in Principal Cities in 30 States

GULF



Built especially for the Ohio State Highway Department, this Kelly-Creswell striping unit has a capacity of almost 800 gallons. It is mounted on a 3-ton Autocar chassis.

Two New 800-Gallon Striping Machines

Two truck-mounted center-lining units were recently built for the Ohio State Highway Department by Kelly-Creswell Co. of Xenia, Ohio. Their capacity is nearly 800 gallons, in two colors.

Each striper is mounted on a 3-ton Autocar chassis and compressed air is supplied by a 105 Schramm compressor with remote control for starting and clutching in the cab. The entire operation is pneumatic and is controlled by the operator from the panel. The zone-marking material is kept in suspension by motor-driven air agitators. The speed of application ranges up to 12 mph.

Three Kelly-Creswell Air Curtain assemblies are built into a guidable trailer, the center line of which is designed for either solid or broken-line application. Provision is made to advance or retard the beginnings or endings of the broken line so that accurate registration can be made with the old line. Atomized cleaner fluid under pressure at all times enables the operator to clean any gun, Air Curtain, or fluid line by manipulating the valves. Two air cylinders raise the trailer to transport position and a platform is provided for line guards, as well as a comfortable seat for the man responsible for placing these guards on wet line.

An interphone system affords communication between the operator and driver at all times. Three small lights, each representing a spray gun, light up as the gun is opened so that the driver always knows what is happening in the rear. The paint tanks are loaded by a 35-gpm paint pump which is driven by the power take-off. All fluid lines are 2-inch galvanized pipes, equipped with full-opening gate valves; this feature makes it possible to apply pre-mixed reflectorized zone-marking material.

Further information may be obtained from the company. Or use the Request Card at page 16. Circle No. 130.

Catalog on Snow Plows

A catalog describing the Nermco reversible blade plow, adjustable V-type plow, and one-way plow for 1 to 5-ton trucks, is offered by the New England Road Machinery Co., 801 E. 6th St., South Boston, Mass. Full specifications, illustrations, and features of the plows are presented.

The design of the reversible blade plow includes a safety automatic blade trip, swiveling castors, unobstructed vision, hydraulic lift, and adjustable underframe for front-end hitch. The moldboard is reversible and can be furnished in 9 or 10-foot lengths. The V-type plows are all-purpose units with adjustable plowing widths up to 16 feet. The one-way plow features a safety blade and coil-spring moldboard trip designed to reduce to a minimum the danger of truck or plow damage. It is equipped with an adjustable-length push frame for use with either underframe or front-end hitch. A swivel joint between the push frame and truck frame permits the plow to adjust to road contour.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 35.

Catalogs on Arc Welders, Electrodes, and Accessories

A number of catalogs and books have been issued by the Hobart Brothers Co., Box DM 831, Troy, Ohio, manufacturer of arc welders, electrodes, and welding accessories. These publications cover a wide variety of topics on welding equipment and techniques. They include discussions on methods of better welding, common faults in design, how to build your own welder, new developments, and the company's line of equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 91 and specify your particular interest.

Two High-Speed Diesels

A broadside on two high-speed diesel engines, the NVHS-1200 and the NVH-1200, was recently issued by the Cummins Engine Co., Inc., of Columbus, Ind. It explains that the NVHS is a 12-cylinder V-type supercharged engine with a maximum rating of 550 hp at 2,100 rpm. The companion model is a naturally aspirated 4-cycle 12-cylinder V-type diesel with a maximum rating of 400 hp at 2,100 rpm.

The description of these engines includes complete specifications as well as torque, horsepower, and fuel-consumption curves. Dimensioned drawings and photographs illustrate each model.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 9.

LANSING F4-½ WHEELBARROW

The most popular wheelbarrow on the market for handling wet concrete. Ask your dealer or write direct to Lansing or one of our warehouses.

LANSING COMPANY
LANSING, MICHIGAN

Builders of wheelbarrows for over 68 years

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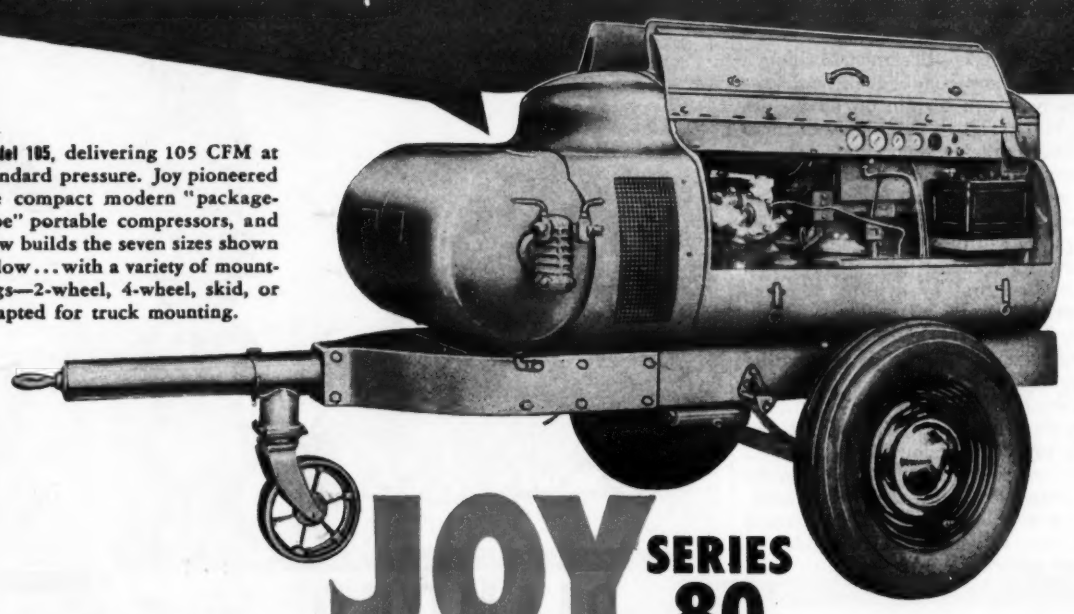
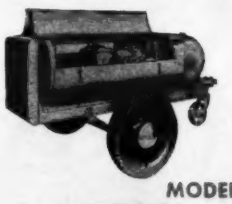
Boston, Mass., 70 Cambridge Street
New York City, N. Y., 28-30 Vandam Street

Here's Portable AIR POWER at Lowest Cost and Topmost Efficiency

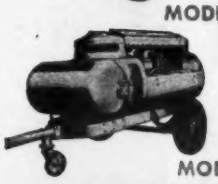


Model 185, delivering 105 CFM at standard pressure. Joy pioneered the compact modern "package-type" portable compressors, and now builds the seven sizes shown below... with a variety of mountings—2-wheel, 4-wheel, skid, or adapted for truck mounting.

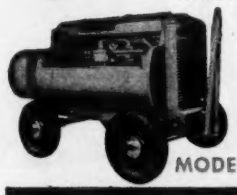
JOY SERIES 80
PORTABLE COMPRESSORS



MODEL 60



MODEL 160

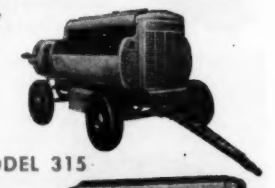


MODEL 210

Compare these Features!

★ 2 STAGE COMPRESSION
★ AUTOMATIC "ECONO-MISER" LOAD CONTROL
★ SEVEN SIZES—60 TO 630 CFM
★ NOTHING TO MATCH THEM FOR MODERN, COMPACT DESIGN—PORTABILITY—RELIABLE AND EFFICIENT OPERATION

WRITE FOR BULLETINS!



MODEL 315

MODEL 500

MODEL 630

WAD C-2074

Consult a Joy Engineer

JOY MANUFACTURING COMPANY
GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

Dolomite Rock Moved To Grade New Road

High Explosives Shatter Tough Rock Formation as Power Equipment Follows To Shape New Roadbed

✦ MORE than one motorist has cursed impatiently, caught in slow moving traffic behind a line of trucks and combines crawling up the crooked grades which used to carry Texas Highway 117 across the Canadian River valley. Up to now there was nothing else a motorist could do, unless he wanted to risk his neck. The high Canadian River bluffs on both sides are some of the roughest terrain in the Texas Panhandle, and all traffic simply had to slow to a crawl.

Happily, that situation no longer exists. A heavy grading contract for 7.3 miles of new road between Borger and Stinnett, all on a new location, was finished this past season under the jurisdiction of District 4 of the Texas Highway Department. This job called for the excavation of a million cubic yards of dirt and rock, and the construction of a few small structures including a 250-foot concrete bridge. The Amarillo contracting firm of Bell, Braden, Barker & Gilvin, Inc., had the $535,115 Federal-Aid contract.

The contract was designed to shape a completely new roadbed through the extremely rough terrain on both sides of the river, and to cut a new channel for a small creek which skirts some of the new embankment. About 105,000 cubic yards of the total excavation was channel change work. About 185,000 cubic yards were Permian Red Bed and dolomite rock excavation, all of which was handled first by drilling and explosives. The remainder of excavation was in the roadway grading, and could be handled by tractor equipment without shooting.

The contract has reduced maximum grades to 4 per cent throughout the job. It provided a four lane roadbed where heavy truck traffic ordinarily slows automobiles down on the grades. A new bridge has also been constructed across the Canadian River under a separate contract. When both jobs were finished early in the fall of 1949, oilfield trucks and combines heading for the Kansas wheat harvesting region no longer tied dozens of fast moving cars up in knots.

Wide New Cross Section

The finished grade on this contract is generally 72 feet wide. Cut sections are sloped 2:1, and fill section slopes vary from 2:1 to 6:1 depending on the height of fill. One fill is 67 feet high, and a cut 123.6 feet deep is less than 750 feet away from that point.

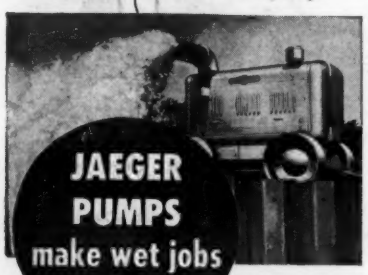
Specifications provided for rock excavation to be placed in maximum 2-foot layers in sections having a minimum of 3 feet of fill. This material, of course, got its compaction from the

(*Continued on next page*)

C. & E. M. Photo

A Northwest Model 6 shovel loads a Euclid rear-dump rock truck on the Texas Highway 117 job. A Caterpillar D7-mounted bulldozer stands by to level the haul road after the Euclid gets out of the way. Bell, Braden, Barker & Gilvin had the contract.

New 2" aluminum pump weighs 105 lbs., pumps 9000 gph . . . Gives high head performance for price of low head pump.



Extra power and double priming action to de-water faster. Built to outlast cheaper pumps by thousands of hours.

Heavy duty 2" to 10" models for low or high head requirements. Super-Jet pumps for pressures to 275 lbs. Diaphragm and caisson pumps. Get catalog.

THE JAEGER MACHINE COMPANY
Columbus 16, Ohio

THEN as NOW

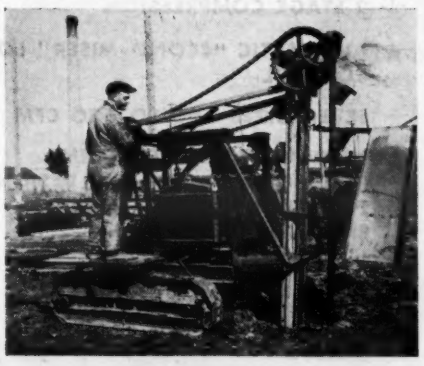
TRADE ◇ MARK

Diamond Roller Chain Drives were used on early self-feeding bucket loaders built by Barber-Greene Company.

Today Diamond Chains are used for various purposes on the latest high speed bucket loaders model 545A to assure dependable service, long life, and negligible maintenance in this rugged service.

DIAMOND ROLLER CHAINS Drive Barber-Greene Equipment

During the years of rapid machinery development, the use of Diamond Chains has been widely expanded. Consistent high quality and technical improvement of Diamond Chains have aided in the performance and high output of the most modern machinery.



On the latest highly mobile "Runabout" ditcher, Diamond Roller Chains serve with extreme efficiency, economy and flexibility.

DIAMOND ROLLER CHAINS

DIAMOND CHAIN COMPANY, Inc., Dept. 487, 402 Kentucky Avenue, Indianapolis 7, Indiana.

C. & E. M. Photos
The Gardner-Denver wagon drill at left is sinking holes through a tough dolomite formation on the Borger, Texas, roadbed job. Above, Assistant Superintendent Schulze (left) confers with General Superintendent Spencer. The Northwest 2¼-cubic-yard dragline at right is loading excavation from a channel change to a dump truck.

equipment which hauled, spread and passed over it. But the density requirements on the soil part of the embankments were considerably higher. Approximately 95 percent of modified AASHO density was required here, with maximum limits of 8-inch lifts on material, roller passes sufficient to develop density, and narrow limitations from optimum moisture.

It was a tough, exacting job. Varieties of material were practically endless. It was all red or white, but there the similarity ended. The Permian Red Bed material is a red, sandy rock of variable hardness, folded and sloped in all kinds of crazy patterns. Dolomite occurs in pockets as a sort of lime formation, mingled with the Red Bed rock. Soils included red clay, white sand, dark loam and some gravel formations. It was a rule rather than an exception for one kind of material to end abruptly, changing into something else due to the massive seismic movements of the earth's crust through the ages.

Pioneering Is First

W. L. "Woody" Spencer, a dirt-wise old-timer who has been with the company for 26 years, was sent out to start the job as General Superintendent. Milton Schulze was selected as his assistant. Years ago Spencer helped to teach Schulze something about dirt, and today they are seldom apart. Dirt has got into their blood to influence their lives.

Both men realized from long experience that pioneering would be the first tough assignment. They knew the rock would be hard, and with work beginning on November 29, they could make a fair bet that the weather might be the same way.

Two Gardner-Denver air compressors, capable of delivering 365 cfm at a pressure of 125 pounds, were the first machines to arrive on the job. They were accompanied by three Gardner-Denver wagon drills, four Caterpillar D7's with Caterpillar bulldozer blades, and two D8's with Caterpillar blades. This was the pioneering force.

Spencer explains pioneering this way: he says, "You've got to open up a job right, so you can get at it with heavier equipment that can get a good hold."

Spot by spot, the high places on the job were drilled, shot and dozed down until the main grading equipment could move in and work comfortably. Reinforced-concrete pipe culverts came in nicely, and were installed in the low places ahead of the first fill material. When pioneering was done, the rock formations destined for shovel and truck work were nicely accessible. The grades had been smoothed down through the dirt work to accelerate the pace of the fleet of rubber-tired equipment.

(Continued on next page)

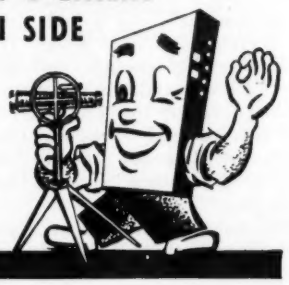
ROETH

CONCRETE VIBRATORS
MOUNTED ON WHEELBARROW CHASSIS
Write for details and prices
ROETH VIBRATOR CO.
1737 Farragut Ave. Chicago 40, Ill.

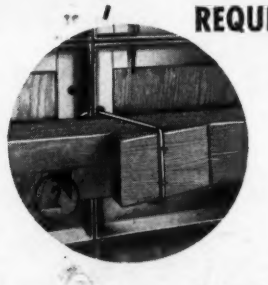
NO ALIGNMENT PROBLEMS WITH UNI-FORMS!

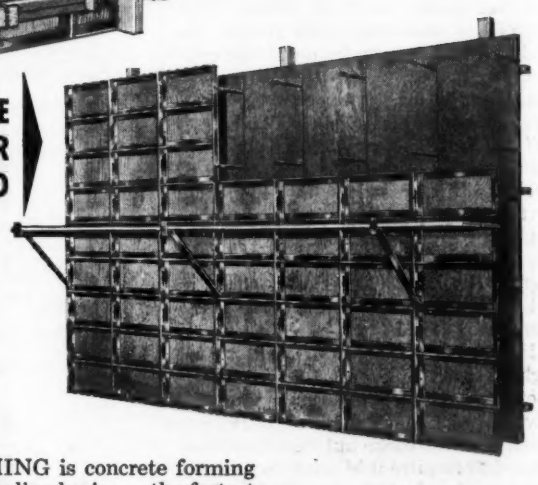
IT'S EASY... AUTOMATIC... REQUIRED ON ONE SIDE ONLY

9' HIGH FORM
ONLY 3 LINERS
ON 1 SIDE



FRONT SIDE
NO LINER
REQUIRED





Alignment . . . an important factor in accurate concrete forming . . . is reduced to a simple mechanical operation in UNI-FORMING.

Steel-framed UNI-FORMS erect into a tight, rigid form requiring no additional structural members . . . minimum alignment is required, regardless of form height. Liner Clamps and wedges secure alignment to UNI-FORMS. (Detail 1) When liners meet, they are overlapped (Detail 2) . . . *no cutting* . . . *no fitting* . . . saves labor and material.

UNI-FORMING is concrete forming on a production line basis . . . the fastest . . . smoothest . . . lowest cost method of forming *any* concrete.

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RENTED...SOLD...OR RENTED WITH A PURCHASE OPTION

Dolomite Rock Moved To Grade New Road

(*Continued from preceding page*)

Grading Equipment Comes In

Spencer built his earthmoving fleet around two separate teams of modern excavating equipment. For the rocky sections he chose a Northwest Model 6 shovel, with three Euclid 11-yard end-dump rock trucks. This equipment was all brand new, and was purchased especially for this project.

The second half of the equipment fleet consisted of four LeTourneau C Tournapulls and four Super C's. Aided by a D8 and a Caterpillar No. 10 ripper, plus three D8 pusher cats, the Tournapull equipment was designed to move the easier digging material at high speed over the average ½-mile haul distance on the job. Five Caterpillar No. 12 motor graders, three sets of sheepsfoot rollers, six water tank trucks averaging about 1,200 gallons, a Rex 3-inch pump and a mobile service unit completed that part of the spread.

This equipment had to have a little help on channel change work after hitting ground water and soft clay when only 75 percent of the channel-change muck was removed. A Northwest Model 6 dragline was brought in then, with a group of six 5-yard dump trucks of various makes. The dragline worked from the top of the Tournapull excavation, backing up as it completed the channel-change digging.

Drilling and Blasting

After pioneering had been finished, drilling and shooting settled down to a rather steady routine, despite the ever changing formations. To give the wagon drills rapid mobility, a small rubber-tired Minneapolis-Moline tractor was hooked ahead of one drill, while a small Oliver Cletrac HG crawler tractor pulled the second machine. The third wagon drill was used as a standby.

The Red Bed rock was drilled 12 feet deep, spacing the 2¼-inch drill holes on average centers of 6 feet. This rock drilled readily enough, and about six 12-foot holes could be put down before dulling one of the Timken rock bits which were used on the end of all drill steel. A drill usually accounted for sixty 12-foot drill holes in its 10-hour shift each day.

The dolomite pockets were considerably harder than Red Bed, but since they occurred practically everywhere with this formation, the drilling progress was about the same. Where large pockets of dolomite were found, the drillers sank their holes on closer centers, from 4 to 5 feet. A free flow of ample air went to the wagon drills through 2-inch diameter Goodrich flexible air hoses, somewhat larger than average.

All drilling was done to a depth of 12 feet, except of course along the slopes, in order to break the material out ahead of the shovel in uniform blocks. The holes were loaded about as fast as they were drilled, using an average of seven 2 x 8-inch cartridges of Hercomite 4 powder per hole. One stick in each hole was fitted with an electric blasting cap. This amount of powder was equal to one pound per cubic yard of rock, but the formation seemed to require it in order to fracture properly ahead of the power shovel.

From 50 to 60 holes were fired at once, using a hand blasting machine. There were exceptionally few misfires, because each circuit was carefully checked for its continuity before pulling the shot.

Rock Excavation

The blasted blocks of stone were then ready to be loaded out by the Northwest 6 and its Euclid hauling units. The power shovel generally crawled along within 15 feet of the base of the bank, picking up a 6-foot slice of broken rock at every stop. The cuts were generally wide enough to allow the Euclid trucks to make a U-turn, and to be headed for the fill when their loads were completed. The Euclids were all protected by a heavy plate guard over the cab, making it unnecessary for the driver to step outside while the truck was being loaded.

Loose rock left behind by the shovel dipper was cleaned up occasionally by one of the D7 dozers serving this part of the work. The machine pushed this loose rock on up ahead where the shovel could reach it easily, usually in the short interval between trucks. The balance of trucks, however, was such that the shovel had very few idle moments.

Loads of broken rock were dumped at the edge of lifts, and spread out by bulldozer. One of the big problems connected with highway grading on a job of this kind is to always be able to dispose of rock if these formations crop up. Woody Spencer never naps on that point. His fills are always in such shape that he can take care of a little rock. If dirt cuts turn out as planned, so much the better.

In shooting and loading, the rock bulked about 5 yards per Euclid load. Figured on the basis of bank measurement in place, each Euclid load which left the shovel carried 8 cubic yards.

Tournapull Work

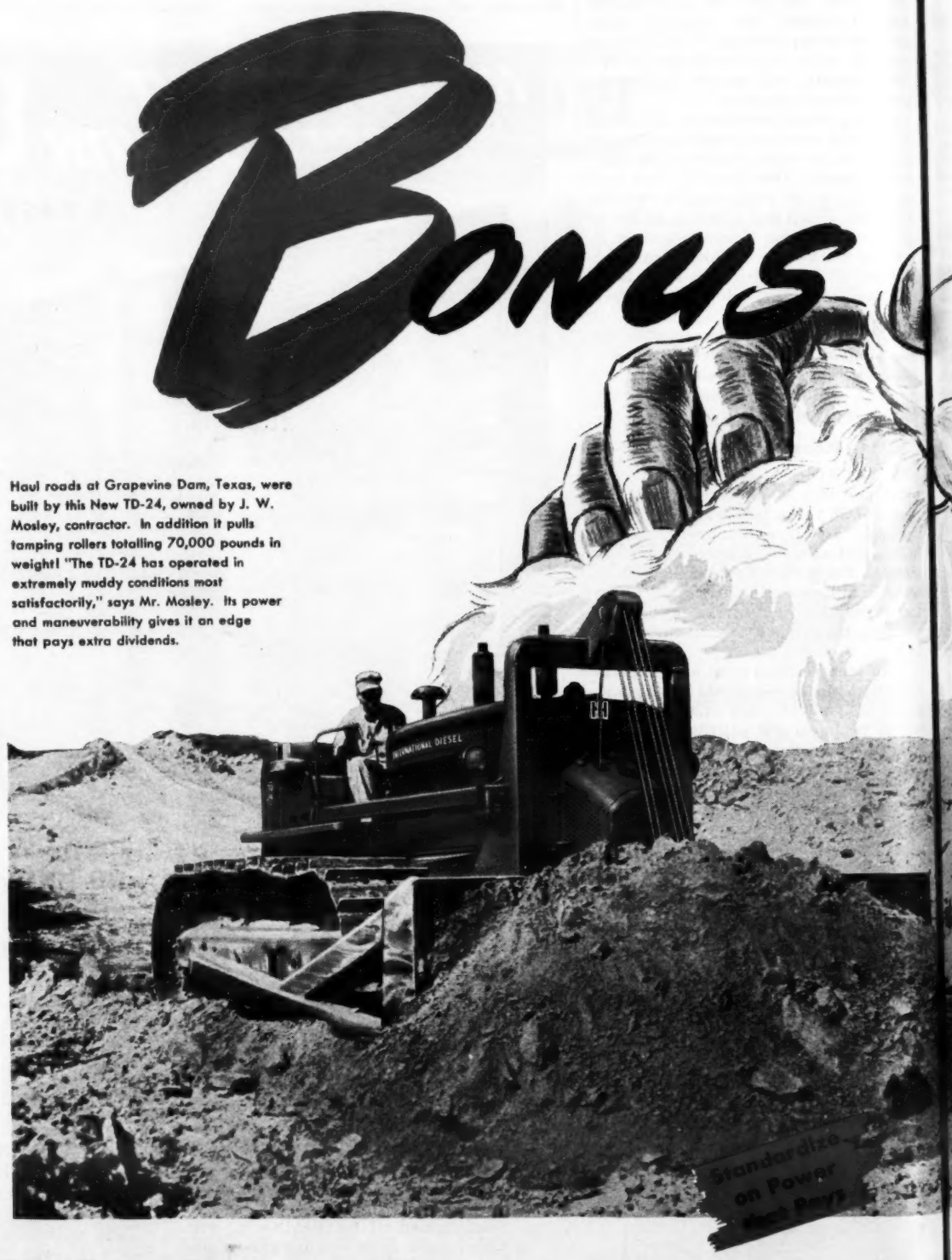
The rubber-tired Tournapulls were used in a strictly conventional manner on this project, except perhaps that their hauls were somewhat long. Caterpillar push cats assisted in their loading, and a Caterpillar No. 18 ripper was well justified on the project by breaking up occasional formations a little too hard to dig, and too soft to shoot.

As the Tournapulls built the embankments and dug the cuts to which they were assigned, they dumped their loads in lifts about 8 inches deep down on the fills. Water was then added if necessary, the lift was scarified, leveled and rolled.

Material from the channel changes on the stream was built into the fills in this same way. Haul roads for the fast Tournapulls were maintained by some of the motor graders, and output was good.

In fact, according to Mr. Spencer,

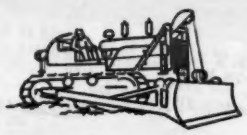
(*Concluded on next page*)



Haul roads at Grapevine Dam, Texas, were built by this New TD-24, owned by J. W. Mosley, contractor. In addition it pulls tamping rollers totalling 70,000 pounds in weight! "The TD-24 has operated in extremely muddy conditions most satisfactorily," says Mr. Mosley. Its power and maneuverability gives it an edge that pays extra dividends.

Standardize on Power that Pays

CRAWLER TRACTORS • WHEEL TRACTORS • DIESEL ENGINES • POWER UNITS



four Super C Tournapulls moved 72,000 cubic yards in 16 days from one cut, hauling an average distance of 2,000 feet one way. Another good performance record was set when four Super C's, three Euclids and the Model 6 Northwest shovel moved 151,000 cubic yards in a month.

Once a shift a mobile lubricating unit visited every piece of equipment on the job, and engine lubricating oil was changed once per week, or every 60 operating hours. Fuel was delivered to the job by Phillips Petroleum Co. in a tank truck. Repairs, if needed, were made by pulling a machine temporarily and hauling it in on a trailer to the heavy equipment repair shop in Amarillo owned by the contracting firm.

C. & E. M. Photo
A Caterpillar No. 12 motor grader on the Borger-Stinnett grading contract gets a lube job from the mobile service unit.

One of the toughest winters the Panhandle has had in a decade roared out of the north last January, and for two months very little work could be done. Operations were resumed in March, and by the last of that month everything was again in high gear, pointing toward completion of the job well ahead of the 300 work day limit allowed in the contract.

James G. Lott, District Engineer for the Texas Highway Department at Amarillo, was in general charge of the job, with V. J. McGee as Senior Resident Engineer.

New Electric Sander Uses Endless Belts

A new Thor Silver Line portable electric belt sander for sanding wood, metal, and stone is announced by the Independent Pneumatic Tool Co., 175 N. State St., Aurora, Ill. It uses endless belts 4½ inches wide x 26 inches long.

The sander features a direct spur-gear drive, a rapid belt-change device, and a new heat-radiating system. This system consists of open-end construction, with belt motion creating air currents to blow generated heat away and heavy-section aluminum fins to conduct heat away to a flat radiating surface which forms the top housing of the tool. A simplified "tracking" arrangement permits easy centering of the belt on the roller pulleys, and a special internal device prevents belts from wearing away the inner surfaces of the housings, the company says.

This sander is available in two models, with or without a dust-collecting system which consists of a suction fan and collection bag. A complete line of sanding belts in various grades and grits, plus a cloth polishing belt, is available for use with the new Silver Line sander.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 8.

Chemical-Spreading Unit For Ice and Snow Control

A circular on the Tarco Scotchman chemical spreader for ice and snow control has been issued by the Tarrant Mfg. Co., Jumel Court, Saratoga Springs, N. Y. This spreader hangs on the back of any pick-up or dump truck. It has a hopper capacity of 200 pounds, applies bagged or bulk material, and stainless-steel shoes guide the spread of salt directly to the rear from 2 to 26 feet wide; or all left or all right. A stainless-steel valve controls rate of application. The folder treats construction and design features of the unit, dimensions, and application rates.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 103.

Specifying Alloy Steel

"How to Specify and Buy Alloy Steel With Confidence" is the title of a new 24-page booklet just published by Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill. The foreword points out that because alloy steels must be heat-treated to attain full strength, there are a number of control steps which should be taken if alloys are to be purchased and used with confidence that they will give the service required. The booklet covers these controls, outlining in detail methods of specifying and buying.

How hazards involved in the purchase and use of alloy steel can be minimized or eliminated is discussed. Also included in the booklet is an explanation of the end-quench hardenability test; data on buying alloy steel on the basis of hardenability; and information on standard and special types of alloy and carbon steels.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 139.

Extra profits are yours whenever the New International TD-24 diesel crawler takes on your heavy earthmoving jobs. By reducing your operating costs while increasing your payload production, the TD-24 actually hands you a bonus every working day!

No other crawler can match the TD-24 in work capacity.

Quick starting, *on-the-go gear shifting,* instant high-low range speed changes, *eight speeds to 7.8 m.p.h. in each direction of travel,* and turns with power on both tracks are a few of the exclusive operating features which make the TD-24 your big bonus producer.

With its 140 drawbar horsepower, matchless maneuverability, and wide range of speeds at your finger tips, the New TD-24 is certainly the tractor you want. Thoroughly field-tested and job-proved, the New TD-24 is now available at your International Industrial Power Distributor's plant.

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Platform Trailer With a Rear Ramp

A line of flat-platform trailers with hinged rear ramps is manufactured by Howard H. Samuel, Inc., of Hackettstown, N. J. Designated the Triumph Model LDR, these trailers are made in 10, 12, and 15-ton capacities. They have an overall length of 26 feet and a platform width of 8 feet.

A special feature of this heavy-duty line is the folding rear ramp. It is permanently hinged to the main frame, and the hinges are set below the floor of the ramp where they cannot be hit by grousers. When the trailer arrives at the job the ramp section is thrown down—a one-man job—and a gentle 20-degree slope is provided for loading.

Two heavy wide-flange I-beams constitute the backbone of the LDR Ramp-trailer. These beams are spliced into the fabricated gooseneck to provide one-piece construction from the gooseneck to the end of the main ramp. The high-carbon-steel kingpin, designed to accommodate any fifth wheel up to 36 inches, is renewable.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 107.

Special feature of the Triumph Model LDR Ramp-Trailer is its folding rear ramp, permanently hinged to the main frame.

Hydraulic Blading Units

A 24-page catalog describing the Baker twin-cylinder hydraulically controlled bulldozers and Gradebuilders for Allis-Chalmers tractors has been put out by the Baker Mfg. Co., 2573 S. 10th St., Springfield, Ill. It presents all features of the design, engineering, construction, and performance of these units.

Bulletin No. 880 highlights the direct-lift design of Baker bulldozers and Gradebuilders, which results in full down-pressure on the blade, and the self-equalizing moldboard, which permits the Baker blade to remain in a horizontal position regardless of the level of the tracks. The catalog points out that the models are designed so that both the bulldozer blade and the Gradebuilder angle blade can be readily interchanged on standard push beams. All features and applications of these units are fully illustrated by on-the-job photographs of clearing, pioneering, grading, and leveling operations.

This literature may be obtained from the company, or by using the Request Card on page 16. Circle No. 46.

Booklet on Glass Blocks

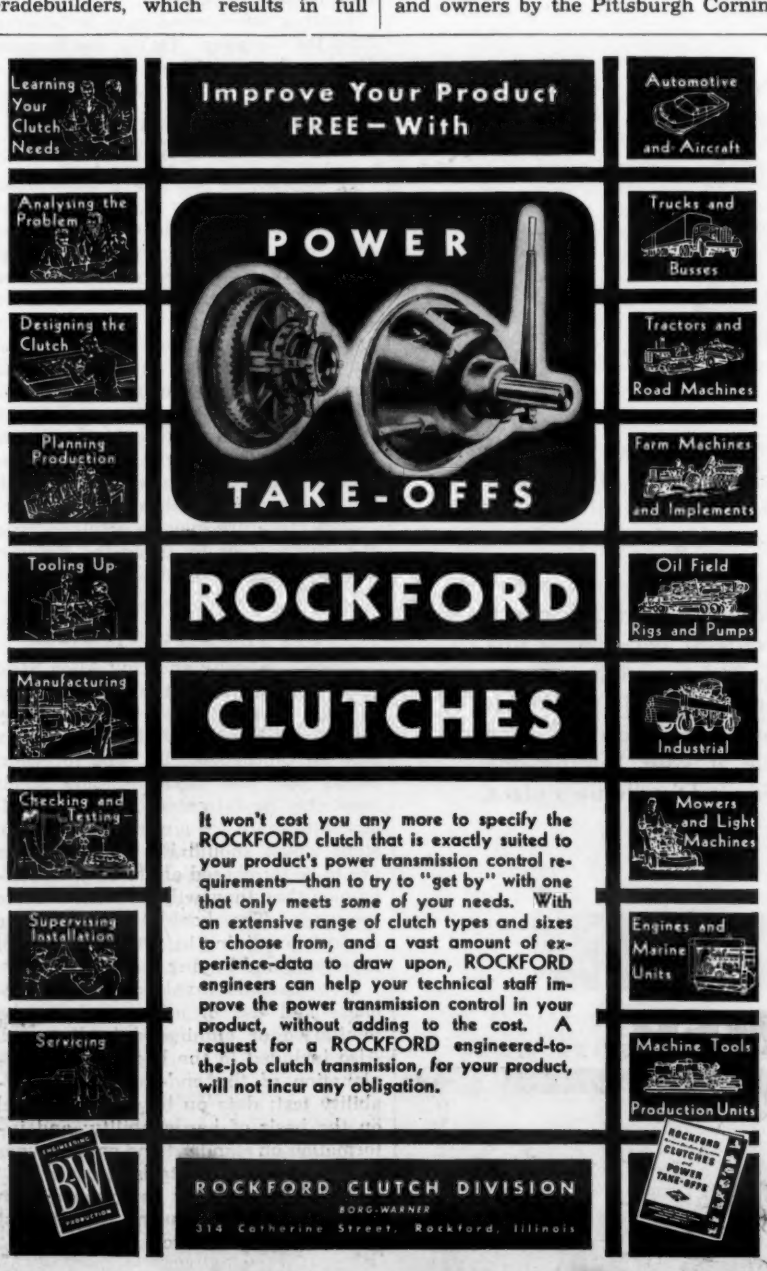
A new 40-page booklet on PC glass blocks, containing general and technical data, illustrations, construction details, and specifications, is offered to architects, engineers, building contractors, and owners by the Pittsburgh Corning Corp., 307 Fourth Ave., Pittsburgh 22, Pa. By dividing glass-block patterns into decorative and functional groups and elaborating upon the specific features of each, this booklet makes it easy to select the correct type for the job requirements.

Its contents include descriptions, features, patterns, sizes, shapes, methods of installation, layout tables, and a variety of technical data on glass blocks. It is profusely illustrated with photographs of industrial, commercial, and public buildings in which glass blocks have been used.

This literature on PC glass blocks may be obtained from the company, or by using the Request Card at page 16. Circle No. 10.

Struble Returns to Reo

A. L. Struble, for the last two years engaged in special automotive research work, has returned to Reo Motors, Inc., of Lansing, Mich., as Assistant General Sales Manager in charge of branches. With Reo from 1928 to 1937, he has also been associated with the Fruehauf Trailer Co. and the Trailmobile Co. In his new post he replaces John Tooker, who has been named Special Assistant to Reo President Joseph S. Sherer, Jr.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It won't cost you any more to specify the ROCKFORD clutch that is exactly suited to your product's power transmission control requirements—than to try to "get by" with one that only meets some of your needs. With an extensive range of clutch types and sizes to choose from, and a vast amount of experience-data to draw upon, ROCKFORD engineers can help your technical staff improve the power transmission control in your product, without adding to the cost. A request for a ROCKFORD engineered-to-the-job clutch transmission, for your product, will not incur any obligation.
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specified for the largest projects in the world...
MODEL E — ELECTRIC VIBRATOR
THE specification by engineers and contractors for Viber Vibrators and recommendation by construction men is mounting evidence of their efficient, economical service.
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A far-reaching program of research has made Viber a leader in the development and application of modern methods of concrete compaction.
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Convention Calendar

Dec. 13-16—Highway Research Board
Annual meeting, Highway Research Board, National Academy of Sciences Bldg., Washington, D. C. R. W. Crum, Director, 2101 Constitution Ave., Washington 25, D. C.

Jan. 15-16, 1950—AED Meeting
Annual meeting, Associated Equipment Distributors, Stevens Hotel, Chicago, Ill. Frank G. Knight, Executive Secretary, 360 N. Michigan Ave., Chicago 1, Ill.

Jan. 18-20—ASCE Meeting
Annual meeting, American Society of Civil Engineers, Hotel Commodore, New York, N.Y. Don P. Reynolds, Assistant to the Secretary, 33 W. 39th St., New York 18, N. Y.

Jan. 23-27—Sand & Gravel and Ready-Mixed Concrete Associations
Thirty-fourth convention and exposition, National Sand & Gravel Association, and twentieth annual convention and exposition, National Ready-Mixed Concrete Association, Stevens Hotel, Chicago, Ill. V. P. Ahearn, Executive Secretary, 1325 E St., N. W., Washington 4, D. C.

Feb. 21-23—North Atlantic Highway Officials
Annual convention, Association of Highway Officials of North Atlantic States, Hotel Statler, New York, N. Y. A. Lee Grover, Secretary, New Jersey Highway Department, Trenton, N. J.

Feb. 27-March 2—AGC Convention
Annual convention, Associated General Contractors of America, Inc., The Palace Hotel, San Francisco, Calif. H. E. Foreman, Managing Director, Munsey Bldg., Washington 4, D. C.

Feb. 27-March 3—ASTM Meeting
Committee week and spring meeting, American Society for Testing Materials, Hotel William Penn, Pittsburgh, Pa. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

March 6-9—ARBA Meeting
Annual meeting, American Road Builders' Association, Netherlands Plaza Hotel, Cincinnati, Ohio. Charles M. Upham, Engineer-Director, International Bldg., Washington 4, D. C.

April 26-27—Transportation Congress
Third Highway Transportation Congress, National Highway Users Conference, Hotel Mayflower, Washington, D. C. Arthur C. Butler, Director, National Press Bldg., Washington 4, D. C.

Virginia Highway Conference Is Held

The third annual Virginia Highway Conference, sponsored by the Virginia Department of Highways and the Engineering Department of the Virginia Military Institute, was held in Lexington, Va., on October 20 and 21. The League of Virginia Municipalities, the League of Virginia Counties, local and State planning boards, the U. S. Bureau of Public Roads, the Virginia Road Builders' Association, and the Virginia Division of Motor Vehicles participated.

In an opening address, State Highway Commissioner James A. Anderson said that the purpose of the conference was to make clear the wisdom of considering Virginia's roads as one interdependent system without regard to local political boundaries, and to demonstrate the responsibility of all groups concerned for making that system as healthy, vigorous, and prosperous as possible.

Burr P. Harrison, Member of Congress from Virginia's Seventh District, underlined the convention's theme by suggesting that "usefulness to Virginians" be considered the guiding principle in building the State's road system. He advocated resistance to outside interests—"Federal master planners or commercial highway users whose viewpoint is wholly interstate"—in the planning of highway projects.

An address by Lt. Gen. Leonard T. Gerow, U. S. Army, on the military significance of the nation's highways indicated that Federal planning is, for some purposes, essential. He estimated the cost of an adequate network of strategic highways at $11,250,000,000.

The question of commercial transportation via the highways was discussed by H. S. Fairbank, Deputy Commissioner of Research for the U. S. Bureau of Public Roads, and G. D. Brooke, Chairman of the Board of the Virginian Railroad. Mr. Fairbank reiterated the need for holding highway load limits to a maximum of 18,000 pounds per axle. "Any increase", he said, "would jeopardize . . . our road investment." Contrasting rail transportation with commercial highway transportation, Mr. Brooke said that railroads "own and maintain their own ways" while "other highway users" are "subsidizing the big trucks to the tune of $354,100,000 per annum or $927.23 per big truck."

In a speech on safety, Capt. W. L. Groth, State Police Safety Engineer, said that the best approach to accident prevention is a campaign aimed at the individual because, with few exceptions, "accident responsibility must be placed directly upon the shoulders of the driver or the pedestrian."

Dr. A. T. Granger, Professor of Civil Engineering at the University of Tennessee, gave the final address of the conference. He spoke of the value of highway conferences to municipalities and states and added that "the total effect of these meetings in improving highway transport in the United States is incalculable".

Heads Cleveland District

John L. Sinclair has been appointed Cleveland, Ohio, District Manager of the Mechanical Goods Division of the Goodyear Tire & Rubber Co. He has been with the Division since 1924.

Power Fine-Grading Unit

A 4-page catalog on the Buckeye Power Finegrader, designed for final grade operations on highways and runways, has been issued by Gar Wood Industries, Inc., Findlay Division, Findlay, Ohio. This unit, operating on paving forms, cuts grades to specifications in widths up to 25 feet. Job photographs, features, component-parts design, and specifications are all included in the folder.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 94.

Any Way You Figure It
(Slide rule, calculus, counting on your fingers) . . .
Bethlehem Wire Rope Means Low Cost per Unit of Work
Actually, it's as simple as 2 + 2 = 4. All you do is divide the purchase price of the rope by the total units of work it does in its life. The answer, of course, is cost per unit of work—the only real measure of wire rope economy.
What is a unit of work? It can be a ton of rock moved by a power shovel. Or a car of coal hauled up a slope. Or a ton-mile in oil-country rotary drilling. These are but three examples; there are many others. It isn't difficult to record, or closely estimate, the amount of work that a wire rope accounts for. That total will be high—and the unit cost low—when your choice is a Bethlehem rope.
It isn't first cost that determines whether a wire rope is expensive or economical. The rope labeled "Bargain" is frequently quite the reverse. You've found a bargain only when the rope cost is low with respect to the useful work accomplished.
On this basis—the only true yardstick—Bethlehem rope is a genuine "buy." Every foot, every inch of it, is built for service. . . built to give you low cost per unit of work. You can order it with confidence.
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Tampa Harbor Channel Widened by Dredging

Drill Boat Blasts Rock for 27-Inch Hydraulic Dredge Jamaica Bay to Pump Out On Spoil Areas

✦ THE harbor at Tampa, on the west coast of Florida, has been improved with the completion of a dredging contract involving approximately 485,000 cubic yards of material. In this contract the lower section of Sparkman Channel in the upper harbor was widened from 300 to 400 feet for a length of 3,752 feet. This additional width was dredged to a depth of 32 feet below mean low water, the same depth as the rest of the channel. Widening of the bend between Garrison and Seddon Channels by 150 feet was also contracted.

The project was performed under the direction of the District Engineer, Jacksonville District, Corps of Engineers, U. S. Army, who awarded the contract to the Standard Dredging Corp. of New York City on its low bid of $527,510. Work started on February 7, 1949, and was finished about 4 months ahead of the scheduled completion date of September 18. The single item in the contract was pegged as unclassified excavation, of which an estimated 392,200 yards fell in the "soft" category, while the remaining estimated 100,800 yards were rock. (The total quantity actually dredged was 485,000 yards.) Drilling and blasting were employed to loosen some of the rock. These operations were carried on from a drill boat, while all the dredging was handled by the Jamaica Bay — a 27-inch hydraulic dredge powered by electricity.

From the deep waters of the Gulf of Mexico, a channel with a minimum depth of 30 feet now extends nearly 30 miles through the outer waters of Tampa Bay, north and east to the protected expanse of Hillsboro Bay at the head of which the city of Tampa is located, and also to Port Tampa. Sparkman Channel leads from Hillsboro Bay up to the principal wharves and piers to and past Garrison Channel. It is in Sparkman Channel to Ybor Channel, the northernmost part of the upper harbor, and in the bend between Garrison and Seddon Channels that the latest dredging has been done.

Rock Encountered

This contract called for a bottom width of 100 feet to be dredged in the area adjoining the existing channel, with a 3 to 1 slope at the side; and widening of a bend by 150 feet. A channel depth of 32 feet below MLW was required, with an allowable overdepth of 1 foot. The maximum depth of material removed exceeded 32 feet in places where marsh land was found rising slightly above water level. The average cut, however, ranged from 12 to 15 feet. The soft material consisted of mud, sand, or shell, while any rock that was encountered below that was either limestone, flint, or marl. Some hard clay was also met during the dredging.

Where the rock was discovered, its stratum varied between minus 12 and minus 32 elevation. The largest amount occupied an area of 50,000 square feet that was opened up by drilling and blasting. This was done from a drill boat, consisting of a 30 x 63-foot steel barge with a 55-foot steel tower at one end. Within this tower was an Ingersoll-Rand QD-65 5½-inch quarry drill on 42 feet of steel including the bit—an I-R Quarry Master Carset bit. The maximum depth of drilling was 35 feet, while the rock stratum varied from 5 to 19 feet in thickness. It was blasted out in a single lift.

A single spud at the stern of the drill barge kept the craft in position while it was at work. The spud is an 8 x 8-inch hollow-steel section 40 feet long. The barge is maneuvered on two forward swing lines, ¾ inch in diameter and with a total length of 500 feet. On this work a swing of 50 feet was all that was required. An American 5-drum hoist was used in the operation of the drill barge—two drums for the swing line, one for the spud, one for the drill steel, and one for the mud pipe.

One Hole at a Time

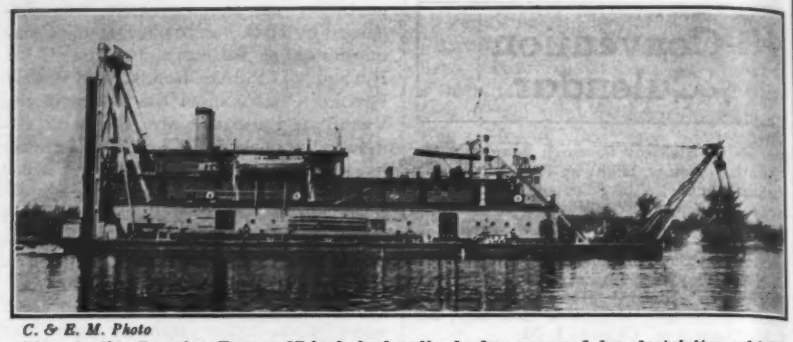
Drilling was done through a mud pipe so the surrounding material could not cave in and bury the drill. The pipe, 38 feet long, was of the telescopic type with a 10-inch top diameter and an 8-inch bottom diameter. The drill hammer was 6½ inches in diameter and had an 8-inch stroke, with the hammer making a quarter turn after each stroke. A 2-ton slapback, bolted to the hammer, held it in position during the drilling. A pair of I-R 500-cfm compressors supplied air for the operations.

Holes were drilled on an average of 6-foot centers both ways at a rate of 1½ feet a minute. With the Carset bit, 3,000 feet of hard rock drilling was obtained before even slight traces of wear were noticed. An air jet washed the loosened material from the mud pipe as the drilling progressed.

The holes were charged with Du Pont Nitromon powder that came in 1-pound cans of 2½-inch diameter. These cans screwed together to form a single column, and usually one can was required for each linear foot of drill hole. Thus a 10-foot hole took 10 cans or 10 pounds of powder. The maximum charge for any single hole was 20 pounds. Holes were drilled and blasted one at a time, an average of 20 minutes being required for one hole. After the hole was drilled, a primer can was screwed into the column of powder cans; with this went a safety plug and a No. 6 cap. The blast was set off from the drill barge after it had pivoted on its spud away from the immediate location of the drill hole. The drill barge worked two shifts—4 a. m to 12 noon, and from noon to 8 p. m.; a 5-man crew was on each shift.

Dredge Jamaica Bay

The hydraulic dredging was done with the Jamaica Bay that was built in Camden, N. J., in 1925. It has a steel hull 172 feet long x 42 feet wide x 11.3 feet deep, and has 797 gross tonnage. From its 30-foot A-frame at the bow, a 66-foot ladder weighing 120 tons is supported; dredging can be done to a 48-foot depth although only 32 feet was dredged on this Tampa job. The dredge can swing 350 feet on a 1¼-inch swing line that runs out to anchors on each side, but the maximum swing on this channel cut was 200 feet. Within the hull at the stern are two cylindrical steel spuds, 60 feet long, 38 inches in diameter, and weighing 20 tons each. The port spud is used for digging, and the starboard spud for stepping ahead after a cut has been completed.



C. & E. M. Photo
Here is the Jamaica Bay, a 27-inch hydraulic dredge powered by electricity, which Standard Dredging Corp. used on its Tampa Harbor improvement job.

Prior to this job, the all-diesel Jamaica Bay broke a crankshaft while dredging at Palm Beach, Fla. With the Tampa project coming up, the major repair job was postponed and the dredge was converted to all-electric operation at Fort Lauderdale. At the completion of the Tampa job, it was

(Continued on next page)

UNIT 1014

10 TON TRUCK CRANE WITH DUAL POWER

- One Engine for Speed and Mobility
- Another Engine for Lifting or Digging
- Gas or Diesel Power
- Road Speed: 32 M.P.H.
- Capacity: 10 Tons

UNIT 1014 is perfectly balanced with modern, adjustable hook-roller construction. Power flows from truck engine in a direct straight-line drive to tandem rear axles, both of which drive. A separate engine powers upper structure, and may be either gas or diesel. Double full-width outriggers provide added stability. This streamlined unit has 5 speeds forward and one reverse, with an auxiliary transmission offering 10 speeds forward and 2 speeds reverse. A road speed of up to 32 M.P.H. makes "going from job to job in a hurry" a simple matter. Large diameter, wide-faced air brakes are used on all 4 rear wheels. A hand operated, shoe type parking brake is provided on propeller shaft. Short turning radius. Dimensions meet highway requirements.

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● Other UNIT Models are available in ½ and ¾ Yd. Excavators and Cranes up to 15 Tons Capacity . . . Crawler or Mobile Types. Fully convertible to ALL attachments.

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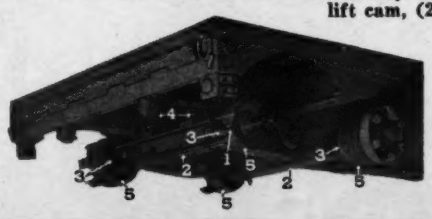
• Deep, wide flange main beams running the full length of the trailer, I-Beam sections for cross-members and outriggers, improved, fabricated gooseneck, and all electric-welded construction. Look at all the other features found only on Jahn tandem axles: (1) constant lift cam, (2) two full-width axles attached to longitudinal rocker beams, (3) worm gear type slack adjusters at each wheel, (4) heavy coil springs at each axle and (5) positive equalizing braking at each wheel regardless of position of axle.



C. R. JAHN COMPANY
Dept. 47
212 Main Street SAVANNA, ILL.

JAHN TRAILERS ALL OVER THE WORLD!

Heavy duty trailers from 5 to 100 tons.

planned to outfit the Jamaica Bay with 4 Fairbanks-Morse O.P.-type 1,600-hp diesel engines that will pull a 1,000-kw generator as a diesel-electric unit.

Power for the dredge during the Tampa job was supplied by the Tampa Electric Co. through a 3,000-foot submarine cable that ran out from shore to a reel barge moored to the stern of the Jamaica Bay. The main pump was driven by a Westinghouse 3,000-hp motor on 13,200 volts at 297 rpm. Four transformers on the reel barge stepped the voltage down to run the other motors on the dredge. Two G-E motors on a 440-volt line operated the cutter head and the swing, the former rated at 500 hp and the latter at 200 hp. Motors for high-pressure water pumps were on a 440-volt line, while the light circuit was on 110 volts. A McIntosh-Seymour 300-hp diesel auxiliary unit served as a stand-by.

Cutter Heads

Several cutter heads, turning at 28 rpm on a 10-inch shaft, were used on the dredge. The rock cutter, built to Standard's own design by the Florida Machine & Foundry Co. of Jacksonville, Fla., weighed 7 tons, was 7 feet in diameter x 6 feet 6 inches long, with 6 blades having a total of 36 teeth. For clay and hard-packed sand a 5-blade saw-tooth cutter was employed, while for light digging such as in sand or silt, a 4-blade cutter head saw service. To keep these various cutter heads in good repair, one General Electric portable and 7 Lincoln 400-amp welding machines, as well as 2 200-amp welders, were available for building up worn-off teeth.

Behind the cutter head a 30-inch intake line ran up the ladder to enter the dredge through a cast steel 90-degree elbow. The 27-inch pump with a 4-vane 88-inch impeller is on the center line of the dredge behind or aft of the 5-drum winding gear. The ladder drum is in the center, flanked by the swing and spud drums off to the side. Behind the drums are the winding motor on the port side and the cutter-head motor on the starboard. The 27-inch discharge line leaves the pump at the top of the impeller and goes along the starboard deck to the center of the stern where a 180-degree swivel connection leads to the floating line.

Above the pump well is a group of Yale hoists with up to 2-ton capacity for replacing parts, and for lifting the manhole lid off the line opening for cleaning. In this area are the machine tools for maintenance which include 2 drill presses, 2 lathes, a milling machine, a power hack saw, and 4 bench grinders. Some of the welding is done in the blacksmith shop at the stern of the dredge, and the rest is handled on the reel barge.

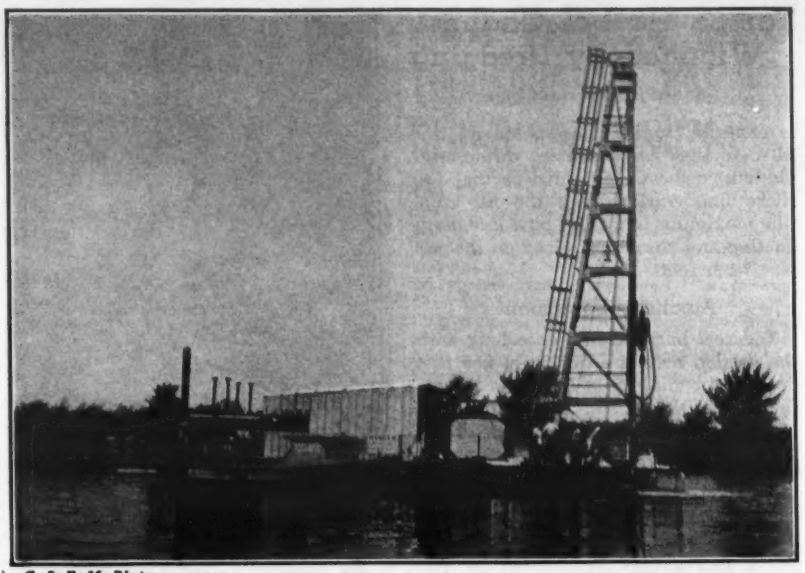
Floating Line

From the lever room the operator of the dredge can see the depth at which he is digging by consulting the gage running up the A-frame. Gages within the cabin indicate the vacuum on the line, which averages between 10 and 20 inches, and the pressure, which ranges from 85 to 100 pounds. The maximum of solids pumped is 12 per cent, and the average velocity is 16 feet per second. The dredge worked 24 hours a day, 7 days a week, and during March, 1949, which was the best month, it dug 153,000 cubic yards.

The floating line consisted of 40-foot lengths of 27-inch pipe, with each section supported by two steel cylinders, 22 feet long x 5 feet in diameter. The pontoons had steel saddles in which the pipe fitted, and they were connected with 10 x 10 timber strongbacks. Mobile Pulley & Machine Works ball joints connected the floating line. The land line came in 16-foot lengths with slip-joint connections. The floating line averaged 1,600 feet long, and the shore line 5,000 feet. A shore crew of 15 to 20 with a dozer tended to the land line.

The dredge material was spoiled on the east side of Hookers Point over a peninsula jutting out into Hillsboro Bay. The low lands along the water were filled in by building retaining dikes with dozers to a maximum height of 10 feet above MLW, and pumping fill behind the earth barriers. Some time in the future a sewage-disposal plant

(*Concluded on next page*)



C. & E. M. Photo

Drilling and blasting from this drill barge loosened rock from Tampa Harbor. An Ingersoll-Rand QD-65 quarry drill operated within the 55-foot steel tower on the barge.

Leader in Value . . . Leader in Registrations

CHEVROLET ADVANCE-DESIGN TRUCKS

CHEVROLET American truck owners recognize the superiority of Chevrolet Advance-Design trucks . . . and buy more Chevrolets than the next two makes combined! They turn to Chevrolet for extra value—for stamina, economy and long-life dependability. They know Chevrolet trucks are easy to handle . . . speedy and high-powered on the highway. Moreover, Chevrolets alone give unsurpassed 3-WAY THRIFT—lower cost of operation, lower cost of upkeep, and the lowest list prices in the entire truck field. Chevrolet trucks are *right* on the job . . . leaders in value—leaders in registrations all over America. See your Chevrolet dealer—for full details.

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

TOP-VOLUME PRODUCTION BRINGS YOU TOP-VALUE FEATURES!

Chevrolet's new 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation. Double clutching is eliminated. Faster shifting maintains speed and momentum on grades. In Series 3800 and heavier duty models.

Chevrolet's power-packed VALVE-IN-HEAD ENGINES provide improved durability and efficiency as well as their world-famous economy.

Chevrolet trucks have the famous CAB THAT "BREATHES"*! Outside air is drawn in and used air forced out! Heated in cold weather.

Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

Chevrolet's SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Uniweld, all-steel Cab Construction • Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows* • Heavier Springs • Super-Strength Frames • Full-Floating Hypoid Rear Axle in the 3600 Series and Heavier Duty Models • Double-Articulated Brake Shoe Linkage • Hydrovac Power Brakes in Series 5000 and 6000 Models • Many Color Options.

**Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.*

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Vulcan Tools

A complete line for every type of Rock Drill, Pavement Breaker and Clay Digger.

Vulcan Tool Manufacturing Co.

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Branch Offices and Warehouse Stocks.
74 Murray St. New York, N. Y.
34 No. Clinton St. Chicago, Ill.

Tampa Harbor Channel Widened by Dredging

(*Continued from preceding page*)

is expected to be constructed on this filled-in site. An easement through an old shipyard was obtained so that the shore line could reach the fill area. The maximum length of pipe line, both floating and shore, required on the job was 7,100 feet.

Auxiliary Equipment

The reel barge that went along with the dredge measured 38 x 40 x 5 feet deep, and contained a 13-foot-diameter reel 16 feet long for hauling in the submarine cable as it became necessary. The reel was operated by a gas engine. The derrick barge, used in shifting the swing anchors and other heavy lifting, was 20 x 60 x 5 feet deep. It housed a stiffleg derrick with a 180-degree swing and a 12-ton lift. Another barge, 105 x 30 x 5 feet deep, had a 60-ton fixed A-frame derrick. Both craft had Caterpillar D311 diesel engines to run the hoists.

Other floating equipment included two tugs—the 55-foot Evelyn with an Atlas 100-hp diesel engine, and the 45-foot Eva, powered by a Caterpillar D13000 diesel. Pipe and other equipment were carried on a wooden barge measuring 190 x 40 x 12 feet deep.

Although on this job the Jamaica Bay did not carry any great amount of diesel fuel, its tanks have a capacity of 24,000 gallons. There is 27 tons of water-storage space.

Personnel

The gray superstructure of the dredge is trimmed with black and contains three decks—the main where the engine room and winding gear are located, the second deck for the crews' quarters, and the top deck for the officers. A crew of 70 mans the dredge. Johnny Owens was Captain of the Jamaica Bay, and F. G. Ellis was the Chief Engineer. J. S. McElroy was Captain of the drill barge. T. P. Pearson was Superintendent of the dredging project for the Standard Dredging Corp.

Colonel Willis E. Teale, C. E., was the District Engineer and A. H. Brown was the Chief of Operations of the Jacksonville District. W. A. Read was Engineer in charge of the Tampa Suboffice and in direct charge of the work with Rufus J. Arline, the Chief Inspector.

Utilizing an endless chain of 18-inch-wide steel buckets, the Ederer trencher digs to controlled depths at intervals of 4 inches to a maximum of 55 inches. It can be installed on either a Ford or a Ferguson tractor.

Trenching Machine

Development of a new trencher has been announced by the Ederer Engineering Co., 2931 First Ave., S., Seattle, Wash. Utilizing an endless chain of cast manganese-steel buckets 18 inches wide, the Ederer trencher digs to controlled depths at intervals of 4 inches to a maximum of 55 inches. The earth is dumped by the buckets onto a conveyor which piles it 70 inches from the center of the cut.

The machine is designed for installation on a Ford or Ferguson tractor, and operates from the tractor's power take-off. Shifting a lever makes the tractor's standard speeds available. A separate transmission in its own gear box gives the trencher slow speeds for digging. This special transmission need not be removed when the tractor is used for other purposes, the company says. At the completion of its digging operation the trencher can be raised above ground elevation.

Further information may be secured from the company. Or use the Request Card which is inserted at page 16. Circle No. 131.

FWD Appoints Managers

The Four Wheel Drive Auto Co. of Clintonville, Wis., has appointed W. G. Klaus Office Sales Manager and G. F. DeCoursin Field Sales Manager.

Direct Positive Copy Of Drawings, Maps

A new direct-positive film for reproducing engineering drawings and maps of physical surveys has been developed by the Eastman Kodak Co., Rochester 4, N. Y. Known as Kodagraph Autopositive, the new film produces a positive copy directly from a positive original drawing without a negative step. It may be handled in normal room light and is exposed on conventional reproduction equipment used for making blueprints or diazos.

Because of the high resolving power of the silver-sensitized emulsion, the new film retains the minute detail and fine lines often found in maps, the company says; detail is further enhanced by exposing Kodagraph Autopositive film with the emulsion side in direct contact with the face of the drawing. Exposure in this manner produces a reverse-reading print but, since the base of the film is highly translucent, this may be read through the back to become, in effect, a right-reading print.

The film has a matte surface on both sides, permitting additions or corrections in either ink or pencil. Erasures may be made by using a standard two-solution eradicator. The film is available in both 30 and 100-foot rolls in the following standard widths: 24, 30, 36, 42, and 44 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 51.

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11—13½% Manganese-Nickel Steel

APPLICATOR BARS

to Repair WORN Equipment!

Available in square, round, flat and special shapes . . . can be easily welded. MANGANAL Applicator Bars eliminate building up of weld material . . . puts your equipment back on the job in less time! Work-hardens up to 550 Brinell as the going gets tougher because MANGANAL thrives on impact and abrasion. Tensile strength up to 150,000 p.s.i.

PRACTICAL APPLICATIONS

- Shovel Buckets and Teeth
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Write Today for Free Copy of "Manganal Marketer". Gives ideas on repairing Quarry, Mining and Contractor Equipment.

Name of Nearest Distributor on Request

STULZ-SICKLES CO.

SOLE PRODUCERS

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Here's Why Crane Users Save Money With

RUD-O-MATIC TAGLINE CONTROL

1. ON MAGNET PICK-UP JOBS—steel tagline cable takes the load while protective slack is maintained in costly electric cable.

2. ON CLAM SHELL BUCKET JOBS—no swing, no sway. Saves time and improves efficiency.

3. ON ALL APPLICATIONS—boom and overhead cranes. A heavy duty coil spring assures constant tension without service problems.

Large bearing and fewer sheaves reduce friction and wear.

Easy installation and easy switch to equipment of similar size.

RUD-O-MATIC COMBINATION MAGNET REEL-TAGLINE

Available in five sizes for boom crane use and 4 sizes for overhead crane application. Used by steel mills, foundries, shipyards, railway shops and scrap dealers.

RUD-O-MATIC TAGLINE

Available in 8 models to provide proper tension and sufficient cable pull out for various size buckets. Used as standard equipment by all leading crane manufacturers.

McCAFFREY-RUDDOCK Tagline CORPORATION

2131 East 25th St., Los Angeles 11, Calif.

LEVELS and FILLS at LESS COST

New Hydraulic Action

SOIL MOVER

It Loads . . . It Carries . . . It Dumps . . . without Stopping! FASTER . . . EASIER!

Carry the load . . . don't drag it. Bucket dumps backwards for easier load spotting and leveling. Makes it easier to fill those hard-to-get-at places.

4-MODELS!

MODELS WR 100 & 200

Wheels behind and inside frame for close work to buildings, ditches and excavating. Model 100-54" cut. Model 200-72" cut.

MODELS WS 100 & 200

Wheels on side of bucket. Wide variety of uses. Ideal for filling in foundations. Model 100-54" cut. Model 200-72" cut.

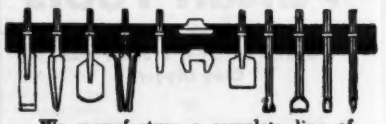
Write for FREE descriptive literature TODAY! Write:

THE SOIL MOVER CO.

Dept. CE-2 COLUMBUS, NEBRASKA

"BICKNELL BETTER BUILT"

PAVING BREAKER TOOLS



We manufacture a complete line of tools for pneumatic paving breakers, rock drills and diggers.

Write for descriptive circular

BICKNELL MANUFACTURING CO.

12 LIME STREET ROCKLAND, MAINE

Repair Experts Say Maintenance Is Easy

Bituminous Roads Stay In Top Shape as Crews Say Seal and Patch-Work Operation Is Routine

By RAYMOND P. DAY,
Western Editor

"HIGHWAY maintenance in Division 1 at Las Vegas, Nevada, is easy. There are no problems."

That quote, from an engineer connected with the activity at Las Vegas, is authentic. But it is not quite true. And thereby hangs a little story of highway doctoring; maintenance work performed in such a way as to eliminate problems.

Examples?

Sure. Blade a gravel shoulder with a motor grader, and then roll the shoulder. Compaction helps appearances, but even more important, it slows weeds down. They just won't sprout as quick or grow as fast.

Did you ever find out what emulsion will do for a seal coat? They have here. And Division 1's success with emulsion as a seal coat and patching agent is causing its engineers and maintenance men to switch over. Now some of the other divisions are also trying it with good success.

Have you ever considered some untried native material for road work, but lacked the courage to try it out? Not here. They will try anything the law allows. And they have recently found that the blood-red lava cinders up around Beatty, near Death Valley, make wonderful non-skid armor coats.

Having trouble with bituminous edges raveling? You say you are? Well, they're not in Division 1. Do you know what they do? They stop it. Later on in this piece you'll find out how.

Do your men from the state capital have a hard time finding hotel accommodations, and will their expense account allowances make ends meet? You say they do? Why not build them a modern motel equal to anything in town? Like hell you can't. They did.

Who Are These People?

What is this, anyway? Who are these people?

These people are the men and engineers of Division 1 of the Nevada Department of Highways, with headquarters in Las Vegas. W. T. "Billy" Holcomb, State Highway Engineer is head man in Carson City. W. O. Wright at Las Vegas is boss of Division 1, and his assistant, in charge of maintenance work, is G. B. Brockway.

Under these men work a small force of 48 maintenance men. Many are Mormons. We mention this only because Mormons as a rule thrive on hard work, simple living, and high ethics when the boss is not around. These are typical. They are high class men—so much so that a contractor's superintendent who hired some a few years ago said, "These unclassified laborers have more ability and ingenuity—and are willing to show it—than most of the skilled labor I can hire any place else."

No research engineer, to date, has isolated the human factor and named a conversion figure to figure out its relation to the cohesion of asphalt. But there is such a thing, and the men of Division 1 have proved it so many times that it goes without saying around headquarters.

Proof? Sure. One of the men, who has been maintaining Nevada highways in Division 1 since 'way back in 1922, is seriously ill. He has cancer of the throat. Accumulative sick leave and vacation rules are taking care of him. He won't worry. Do you know why? Because the old fellow made a lot of asphalt stick in his time, and in doing so, he made a lot of friendships that stuck just as well. You can't define the human factor in road work without seeming to moralize . . . .

The Division Organization

Centralized control is also a part of the efficiency of the division. The old days of isolated road camps are nearly over, these days. The chain of authority centers in Las Vegas, and the highway maintenance job is controlled better from that central point.

Joe Christenson, maintenance foreman, controls maintenance work generally in the entire division. His head-

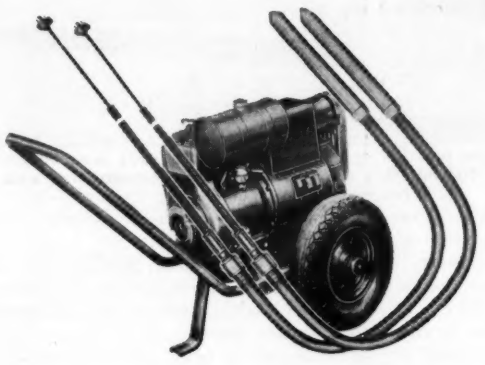
(*Continued on next page*)

Van Dorn POWER gives you THOUSANDS of HAMMER BLOWS per MINUTE!

Van Dorn Electric Hammers give you hundreds of ways to save construction time and money! They drill in concrete, stone or brick —chip, clean and scale metal—gouge, shape and notch timbers—drive spikes—tamp and vibrate concrete forms—scuff concrete surfaces and remove form marks—handle demolition jobs. Light, compact, completely self-contained. Operate from A.C. or D.C. outlets or portable generator. See your nearby Van Dorn Distributor for free demonstration of four models. Write for catalog to: THE VAN DORN ELECTRIC TOOL CO., 787 Joppa Road, Towson 4, Maryland.

FOR POWER SPECIFY "Van Dorn" PORTABLE ELECTRIC TOOLS

(DIV. OF BLACK & DECKER MFG. CO.)



the generator unit is a hundred feet away

But it makes no difference — because of the easily handled electric cable of this new, lightweight, high frequency, electric vibrator . . . no need for flexible shafts . . . necessary movements of generator unit are minimized.

Built for one-man operation, the CP-220 Vibrator is designed for concretes of 2" slump and over; walls, footings, columns, floor and roof slabs; precast piles and similar products.

Two CP-220 Vibrators are powered with a CP-2KW gasoline-driven Generator, 220 volt, 3-phase, 180 cycle.

Write for further information on the CP-220 or other CP Vibrators.

* * *

Every requirement for mass or reinforced concrete is met by seven different models of CP Vibrators — pneumatic and electric — including the new CP-5190 High Frequency Vibrator for low-slump concrete specified on current dam projects.

CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Repair Experts Say Maintenance Is Easy

(*Continued from preceding page*)

quarters are in Las Vegas. Marvin Waite is up at Glendale, with responsibility for the eastern and northern part. Both men work under supervision of Brockway.

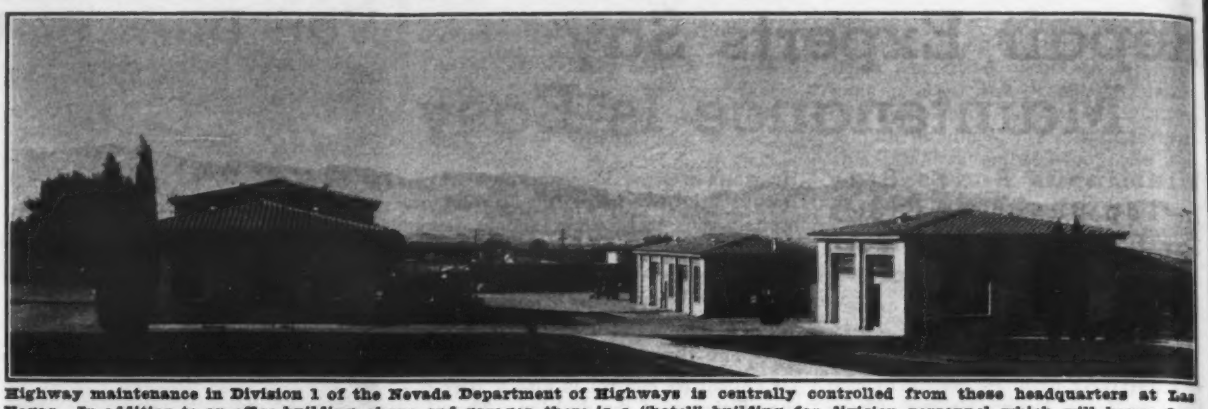
Christenson supervises the work at Las Vegas of a headquarters shop crew. This crew consists of 4 mechanics who take care of major equipment repairs all over the entire division, a blacksmith, a sign painter, two other painters, a watchman and a gardener. The headquarters grounds are beautifully landscaped.

Four teams of two men also work from Las Vegas. Known as a Highway Maintainer and a Maintenance Laborer, these teams of men go out usually with a motor grader; sometimes with a loader and truck, to perform maintenance work. They blade shoulders, clean out culverts, remove muck in sand-filled dips caused by flash floods, and haul loose gravel away from deep cuts.

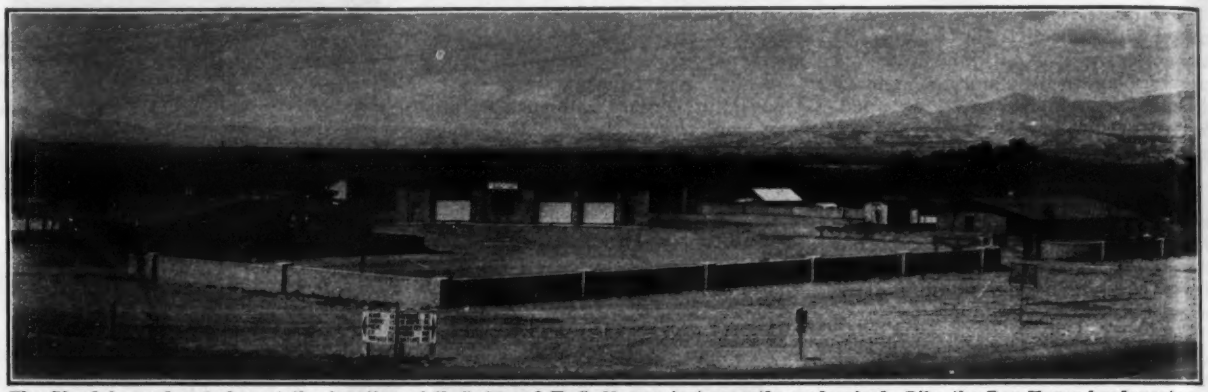
A tractor operator also works out of Las Vegas, as does a spare motor-patrol operator, a shovel operator, and a crushing-plant operator. The crushing-plant operator also doubles over during the hectic summer sealing season as the operator of a 1,200-gallon Etnyre pressure distributor owned by the division.

In addition to these men, Las Vegas also controls a 3-man crew stationed at Searchlight, far down in the southern corner of the state. This crew operates an Adams motor grader, a dump truck, and a Hough loader on an International tractor. Special seal-coat work down there is handled by equipment from Las Vegas.

There is also a 2-man outfit, rather isolated, at Indian Springs and Lathrop Wells. A 2-man crew at Alamo has a new American patrol, equipped also with a loader attachment. According to the men who use it, this machine is performing excellent multiple-purpose work. Its job consists of blading, dressing and loading out excess material on the slopes and shoulders of a low-travel bituminous highway. This it is well equipped to do, and for that particular locality is working out well.



Highway maintenance in Division 1 of the Nevada Department of Highways is centrally controlled from these headquarters at Las Vegas. In addition to an office building, shops, and garages, there is a "hotel" building for division personnel which will house five.



The Glendale yard and shop at the junction of U. S. 93 and U. S. 91 was just recently modernized. Like the Las Vegas headquarters, its buildings are of concrete-block construction with red tile roofs.

Other equipment at Las Vegas under Christenson's supervision include a Thew-Lorain truck-mounted shovel, two Caterpillar No. 12 motor graders, a Standard and two Littleford 300-gallon hot pots, a 100-ton per hour Cedarapids crushing plant, a flat-rack transport truck, a shop-built cherry picker for odd jobs at lifting, several 1½-ton trucks, and a heavier Walter and FWD truck. The latter are used for heavy hauling in summer, and are equipped with push or V-plows for snow removal in winter.

Marvin Waite down at Glendale has only a No. 12 Caterpillar motor grader, a Hough loader, 3 trucks, and an option to draw on the Las Vegas pool whenever his work overloads his capacity.

This may seem to the casual engineer a small crew and little equipment for an entire division the size of Rhode Island and Delaware, but several factors enter into the picture.

First of all, the entire organization from top to bottom is cost-minded. Maintenance men don't change with every shift of the political winds in the state capital. They stay, as a rule, with little turnover, rendering good service, just as loyally to either party who happens to control the reins of the state. Thus they get along with a minimum of equipment and men.

Second, the men all do an unusually full quota of work every day. Is this unusual? It would seem so. Here at this headquarters, men scheduled to go out to work at 7 a. m. go out to work at 7 a. m., and this doesn't mean 7:10. There is no compulsion; no bulletin board full of written orders; no feeling of bossing. The watchman makes it easy for the boys to get out on time by fueling every piece of equipment which

(*Continued on next page*)

C. & E. M. and Nevada Dept. of Highways Photos

Here the Division's Cedarapids crusher turns out ¾-inch patch rock and armor-coat chips.

A Caterpillar grader dresses a highway shoulder and gets rid of weeds.

Division 1 uses a Wood Preparizer on experimental reconstruction of an old bituminous road.

An International tractor teamed up with the Preparizer on the job.

comes in at night. He also performs odd service jobs, and a mechanic sometimes helps.

In the more isolated stations, equipment operators carry fuel and lubricants in their pickup.

Possibly a third factor which influences the small size of the crew is the job itself. Total state-maintained mileage in Division 1 is a little over 500 miles, and that is practically 100 per cent bituminous construction. Route 91, a transcontinental highway with very heavy truck traffic, is for the most part hot-mixed asphaltic concrete. The other roads are of mixed-in-place construction, many of them over 20 years old. These highways lead through a country which is high, reasonably mild, and dry—except for the flash floods which come any time from July to September.

This desert country is indeed favorable to highway maintenance efficiency, but let's don't forget the skill, the determination, and good practices of the maintenance men. Without them, the situation could easily get out of hand. These roads pass through desert sand, through rocky cuts, over high mountains and dry lake beds. Favorable as it is, the roads need frequent attention to keep them in good shape.

It should be considered, when thinking of these maintenance men, that they work in a rather unique state. Nevada has 110,000 square miles, and less than 140,000 native residents. Its capital, Carson City, is the smallest in the nation. Yet Nevada is a "bridge state". It carries the brunt of an extremely heavy transcontinental traffic — both passenger automobiles and trucks—passing from Utah and the east into California.

No Gas Taxes Diverted

To finance the annual maintenance in Division 1, roughly $278,000 will be required this fiscal year. A breakdown of the budget shows these figures:

Maintenance administration	$22,868
Construction authorizations	14,800
Specific authorizations	54,395
General maintenance	167,646
Bridge maintenance	1,000
Snow removal	600
Washouts	500
Signs	12,500
Traffic striping	3,700

Construction authorizations include any new buildings, plant construction, and any specific changes in thickness on pavement. Specific authorizations cover more ordinary maintenance, as for example, a routine seal-coat and armor job.

Emulsion Makes Good Seal Coat

Division 1 has had excellent results with emulsified asphalt in its seal-coat work, and so long as the excellent results continue, plans to use it in the future. Most of the emulsion used to date has been supplied by American Bitumuls Co. from their California refineries. It is composed of from 55 to 60 per cent of asphalt, emulsified in water.

Sealing last year called for approximately 0.2 gallon of emulsion per square yard, but this year this will be increased to 0.25 gallon in an effort to use slightly larger chips. It is expected that ½-inch-minus rock will be used, a slight increase over the ⅜-inch size used last year.

Heating is seldom required on the emulsion, and the maintenance men find that it is a flexible material which permits small as well as big jobs with a minimum of equipment. Two new 15,000-gallon storage tanks are being installed at the Glendale yard to take this material.

Ordinarily the emulsion is applied only a very short distance in front of the trucks which spread the armor chips. The operator of the distributor has become extremely skillful in cracking his valves at just the right time to make the joint. About 20 pounds of armor chips per square yard are spread by a Buckeye box on the rear end of dump trucks, and the chips are then rolled by an 8-ton Buffalo-Springfield roller to bond into the fresh asphalt.

The work is thus finished as it goes along, leaving the road open to traffic with a minimum of delay during the work.

Emulsion has also found its use in patch work along the edges of bituminous pavements, where dual wheels on heavy trucks whip the bituminous mix away. It has been found that a penetration type patch, made with emulsion and a uniform grade of ¾-inch crushed rock, gives lasting service.

Patterned after the so-called "Virginia Mix", the ¾-inch rock particles interlock, and the interstices partly fill up with asphalt. Patches made with this material are often seal-coated with armor chips after they are put down, and where rain is not excessive they often build them slightly high just along the edge to increase their life.

This type of patchwork and the seal-

(*Concluded on next page*)

LIGHTER . . . EASIER TO HANDLE . . .

you place concrete *FASTER* with a

MAGINNISS

HI-LECTRIC CONCRETE VIBRATOR

WHY? Because there's no flexible shaft! No engine to move! The Generator is set off the job, out of the way. Only a lightweight cable runs to the vibrator. One man operates it, the On-Off switch is at his fingertip. 9,500 VPM with no power loss insures faster and more uniform concrete placement.

SAFE? Sure, because generator and motors are wound for 110 volt, 180 cycle operation, and are grounded.

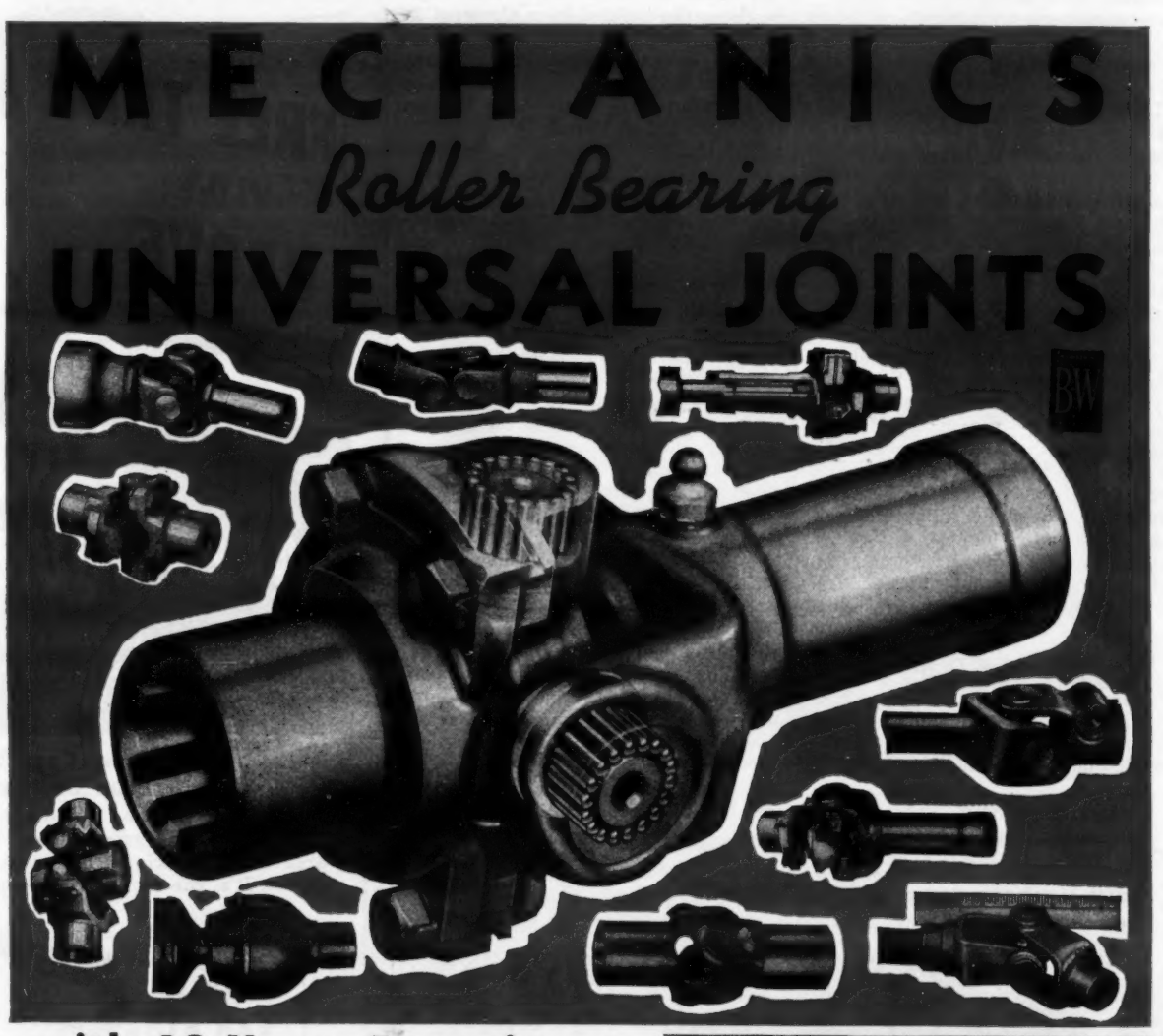
—EXTRA FEATURES—

The Hi-lectric Generator operates 2 vibrators, as well as standard floodlights and Hi-lectric Saws and Grinders. Versatility, light weight, low operating and maintenance cost are just a few of the many advantages of Hi-lectric equipment.

Maginniss
POWER TOOL CO.

129 DISTL AVE., MANSFIELD, OHIO

MECHANICS
Roller Bearing
UNIVERSAL JOINTS



- with 40 Years Experience

Back of every MECHANICS Roller Bearing UNIVERSAL JOINTS application is over 40 years of experience designing, building, applying and servicing universal joints — for millions of cars, trucks, tractors, farm implements, road machines and industrial equipment. A complete engineering service and two huge factories, using the most modern and efficient equipment, are available to help improve the propeller shaft units in *your* product. Our new catalog — showing the complete line of MECHANICS Roller Bearing UNIVERSAL JOINTS and PROPELLER SHAFTS — will be sent to manufacturers, upon request.

Two modernly equipped plants efficiently producing universal joints and propeller shafts exclusively.

MECHANICS UNIVERSAL JOINT DIVISION

Borg-Warner • 2030 Harrison Ave., Rockford, Ill.

Repair Experts Say Maintenance Is Easy

(*Continued from preceding page*)

ing operation very largely control the operation of the Cedarapids crushing and screening plant. This machine works many months out of the year, particularly during the winter, building up stockpiles for use in summer. Ordinarily they use ¾-inch wire mesh on the upper deck of the sizing unit, with ½-inch mesh on the second deck. Material retained on the lower deck is used for armor chips, while the minus material is used for premix.

Premix Made in a Circle

Wherever possible, premix bituminous material is road-mixed in a large circle by motor graders. This practice eliminates time lost in turning the machine around at each end of the line, and adjusting the blade. The machine simply travels around the outer edge of a circular stockpile, cuts out its windrow, and asphalt is then applied by distributor. Several applications are generally required, with plenty of blade work between, to mix a windrow. The division has had the best luck with SC-2 and SC-4 for this type of material.

This premix is often used for upper decking work, for patching along the sides of pavements, and for general strengthening of short but weakened sections. Where it is premixed at a stockpile, the material is usually handled by one of the front-end loaders, to dump trucks which then haul it out to the job.

Maintenance men doing this type of work are trained to look years ahead, instead of weeks. Some of the highways in the division are marked this year for sealing work in 1952, or for upper decking the year following. And the only indication in 1949 that they will need that attention are the first few signs of slow oxidation, minute cracks, with occasionally here and there a slight distortion.

Maintenance men look with critical eyes at a pavement which to the casual tourist seems smooth, silent and safe.

Flash Floods Are Devastating

Summer flash floods are incredible, but they happen. From July to September or October is their season. Storm clouds gather, lightning flashes, thunder booms, and the rain drums down in fury. The desert, sloping off most places from high mountains, doesn't have enough ground cover to stop the water. It roars down through the country, floods highways, fills watercourses and drains, and brings general havoc. Dips in main highways frequently are filled with 2 feet of sand and boulders.

And then in about two hours the desert is dry again. The water soaks in and everything looks the same as before. Nothing but cleanup work remains.

That is where the truck-mounted power shovel, trucks, and front-end loaders come in again. Muck is scooped off the pavements, erosion holes repaired, and washouts along the shoulders are filled. And tourists hurry on their way.

A "Hotel" at Headquarters

During the war, overnight accommodations in Las Vegas were hard to find. Prices were so high that expense accounts allowed by law frequently would not cover the cost. Since Las Vegas is also quite isolated from Carson City headquarters, a modern motel was built for the convenience and comfort of any transient engineers from the Highway Department who might have to stay overnight in Las Vegas.

The building will house five persons comfortably. It is the equal in every respect of a fine hotel, for comfort and convenience. Patrons pay a small overnight charge to take care of the cost of cleaning and laundry of linens. The building was made out of cement building blocks, turned out by Highway Department personnel in their spare time on a block machine owned by the Highway Department.

All other buildings are the same type, with red tile roofs. Headquarters buildings include a main administration office building, a carpenter and paint shop, storage garage, blacksmith shop, a materials storage room, and the main repair garage. The latter is subdivided into a stock room, office, heavy equipment repair floor, wash rack and lubrication room.

The offices in the administration building are quietly luxurious and utterly businesslike. A fuel island in the main yard holds two gasoline pumps and a diesel fuel pump. The entire headquarters site at Las Vegas comprises about 4 acres.

The division has very recently modernized its Glendale yard, also. It acquired a strategic plot of ground at the junction of U. S. 93 with U. S. 91. Buildings are replicas of those at Las Vegas, made also of cement block construction. Two homes at this site furnish a permanent place to live for the key maintenance personnel stationed there. Buildings of the same type have been constructed at Searchlight.

As maintenance work goes on year after year, the highways through Division 1 seem to take on a dressed up appearance even better than the day they were dedicated. Slopes get smoother, so do shoulders, asphalt pavements come to life under traffic and maintenance, and generally the drainage patterns are improved. It is highway maintenance at its best . . . the kind of work which looks into the future, anticipates trouble, corrects it before it happens.

That is why we said, at the start of this article, that it was not quite the truth when the engineer said, "Highway maintenance here is easy."

They just know how to make it seem easy!

Waterproofing Manual

A booklet entitled "Exterior Waterproofing Manual" has been prepared for free distribution by the Wurdack Chemical Co., 4977 Fyler St., St. Louis 9, Mo., manufacturer of a one-coat invisible Silicone masonry water repellent called Crystal.

Containing 32 pages of information on specifications, methods and amounts of application, costs, etc., the new manual is designed to answer many questions which arise in the exterior waterproofing of masonry construction. Sections on masonry material such as brick, stucco, concrete block, pre-cast stone, and others have been included, with complete data on the proper waterproofing of each.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 97.

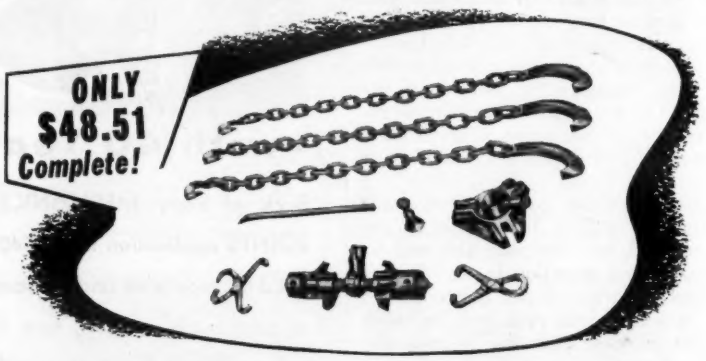
Simplex
UTIL-A-TOOL

SAVES HOURS & DOLLARS

ON PUSHING • CLAMPING • HOLDING • PULLING • BENDING • LIFTING
SPREADING • LOWERING • PULLING WHEELS AND GEARS

A Low-Cost Work-Saver for Scores of Maintenance Jobs!

When you're stumped by a tough job, call on the Simplex Util-A-Tool to handle it easy, safe and fast. This handy, all-purpose, easily portable tool is quickly set up for fast action that saves time and muscle-power. It's "the tool of a thousand uses" for maintenance and repair.



10-PIECE SET INCLUDES—10-ton Push-Pull Jack (extended by 1½" pipe in nut wells); No. 3A Spreader Jack (extended by 1" pipe in base and ½" pipe in cap); 2 drop-forged Sky Hooks (for pulling in); 3-Way Base and Wheel Puller; 3 Heat-Treated Chains ½" x 40" fitted with Grab Hooks and Claws; Chisel-Pointed Lever Bar and Heavy-Duty Tool Box.

Let the Simplex Util-A-Tool prove itself on the job—Ask your Simplex Distributor *today* for a FREE TRIAL without obligation or write direct to us for full details in Bulletin: P & P 48.

Ask for FREE TRIAL *In Your Own Shop!*

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LEVER • SCREW • HYDRAULIC
Jacks

TEMPLETON, KENLY & CO.
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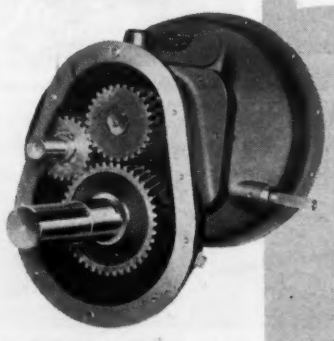
for cranes, shovels, rock crushers, pumps, generators, etc.



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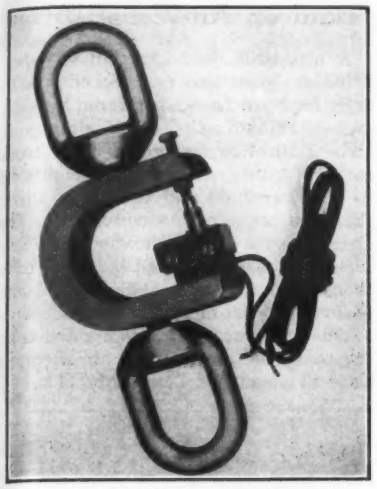

The Dyna-Switch is a new safety control device to prevent accidental overloading of hoists or cranes. The mechanism can be set to cut off the motor power or merely warn with a bell or light whenever overloads are applied.

New Safety Switch Prevents Overloads

A new safety control device designed to prevent accidental overloading of hoists or cranes has been developed by W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, Ill. Acting as a "silent policeman", the Dyna-Switch automatically cuts off the motor power when overloads are applied.

The instrument consists of a U-shaped tool-steel bar with a sensitive microswitch set across the ends. If the load limit is exceeded, the flexure of the bar trips the switch and energizes a relay to cut the power source; or, if desired, to start a warning bell or light. The Dyna-Switch may be placed on the hoist hook or above the hoist.

This device may be set for any point between 500 and 10,000 pounds, but will withstand accidental loads up to 17,500 pounds. To change the switch cut-out point in the field, it is only necessary to lift a weight of desired capacity and turn the adjustment screw until the switch operates.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 86.

Roebling in Cincinnati

A new office and warehouse has been opened at 3253 Fredonia Ave. in Cincinnati, Ohio, by John A. Roebling's Sons Co., of Trenton, N.J. W. K. Hanna, former head of the Pittsburgh branch, is Manager.

New Double Scales Simplify Slide Rule

The Pickett 800 slide rule simplifies the traditional log log scale arrangement through the use of a new double or "back-to-back" scale, according to an announcement by Pickett & Eckel, Inc., 5 S. Wabash Ave., Chicago, Ill.

The new back-to-back scale accomplishes four things not done before in slide rules, the company says. It places the six log log mated scales together to make three double scales, with numbers and their reciprocals back to back for greater accuracy and easier reading. It provides extra area needed to place C scales on both sides for easier operation, without enlarging the rule. It permits inclusion of a DI scale. The white or blank space saved by using back-to-back scales not only permits addition of the extra C and DI, but also makes the rule simpler looking, easier to use, and easier to understand, according to the maker. The Model 800 rule also bears a true ST scale, which is a true average of the S and T scales for angles up to 5.73 degrees.

All scales are decimally divided, coordinate front and back; are full unit length; and refer to the C and D scales. They are traditional, familiar to all, and require no special study or instructions to use. The rule is 12⅛ x 1½ x 5/32 inches in size. The distortion-free magnesium-alloy body weighs less than 4 ounces. An instruction manual is furnished with the rule.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 52.

Drill Rig Makes Cut Along Curbs, Tracks

To remove the outer two of four sets of streetcar tracks from San Francisco's famous Market Street and prepare for resurfacing, Eaton & Smith employed the unit shown in the accompanying photo to cut along curbs and tracks before excavating. This preparatory cutting prevented an over-break on the pavement when excavating.

A row of Gardner-Denver 3-inch automatic-feed drifter drills, mounted in quickly adjustable saddles on a heavy crossbar, cut the asphaltic-concrete surface and concrete base material. By using a Jaeger 600-cubic-foot compressor on the unit, the contractor was able to put 5 drills to work. A row of five 2⅛-inch holes, 12 inches apart, was drilled in about ½ minute. The truck was then shifted 6 inches, and a second series of holes was drilled between the first series and one hole beyond, before the truck moved on to the next drilling position.

A truck-mounted unit consisting of Gardner-Denver drifter drills and a Jaeger compressor makes a preliminary cut along streetcar tracks on San Francisco's Market Street, to prevent over-break on the pavement during excavation.

Last winter's "OPERATION SNOWBOUND" proved the economy of La Crosse low boys in moving big equipment QUICKLY from one stricken area to another.

TO REDUCE THE COST of opening roads after deep snows, remember *adequate trailer capacity is just as important as adequate equipment.* For with trailers you can increase the efficiency and economy of all your big plows and dozers — by moving them into critical areas faster . . . getting them working faster . . . on to next assignments without delay.

You will also find heavy-duty La Crosse low beds especially well fitted for winter hauling because they *trail easier on slippery roads . . . are easier to load and unload . . . have extra-capacity platform on flat gooseneck for carrying extra tires, sand, cinders, etc.* Choice of single, dual or tandem axle models from 6 to 67 ton capacity — standard or custom built.

LC-8

Check Today!

LA CROSSE TRAILER CORPORATION, La Crosse, Wis.

☐ Rush complete details on LaCrosse Trailers ☐ I may be interested in a.....ton trailer about..... (date)

for hauling..... (type of equipment)

Name.....Title.....

Employed by.....

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Low-Cost TRAILER TRANSPORTATION

OMAHA DRAGLINE BUCKETS

Tops 'em all

In PAYLOAD
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For over 36 years Omaha Dragline Buckets have been saving money — making money for contractors everywhere, because the know-how of many contractors and engineers has been built into Omaha Buckets to give an increased load, and a sturdier design and more rugged construction for the tough digging jobs. For top performance and profit on the job, Omaha Dragline Buckets *Tops 'em all!*

Write for Complete Catalog

DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

Impregnated Cotton Lines New Reservoir

An impregnated cotton-fabric lining will be used in the construction of the 300,000,000-gallon Baldwin Hills Reservoir to prevent loss of water through seepage. This is announced by The Cotton-Textile Institute, 271 Church St., New York 13, N. Y. The contract for the reservoir, awarded by the Los Angeles Department of Water and Power, provides for the placement of approximately 500,000 square feet of fabric-reinforced asphaltic membrane.

Soil conditions will govern to a large extent the area to be covered. Many areas within the reservoir have sand and gravel strata which make them quite unstable, and these areas pose the problem of preventing seepage and resultant consolidation of the soils. Preliminary tests have demonstrated that the fabric reinforcement allows people to walk and work on such areas without danger of rupturing the membrane. They have also demonstrated that the loose weave of the fabric allows for a heavier application of asphalt than is ordinarily possible.

Specifications governing the construction call for a prime coat of asphaltic cut-back at the rate of a gallon or more per square yard, depending on the texture and porosity of the soil. Then a curing period of a few days to a month or more will elapse. After the curing period, a coat of 40 to 50-penetration asphalt cement will be applied at the rate of ½ gallon to the square yard, and the cotton fabric will be placed. Finally, another ½ gallon of 40 to 50-penetration asphalt cement per square yard will be applied. This will penetrate individual strands as well as the area between the strands to give thickness and strength; an eventual amalgamation will take place between the prime and the asphalt.

The Cotton-Textile Institute believes that cotton membrane fabrics can be applied to irrigation canals and ditches as well as to reservoirs, and that it may also have application to earth dams and levee fills for flood-control work. The Institute is now working in collaboration with the Asphalt Institute to devise an optimum low-cost fabric membrane that will be prefabricated on a mass-production basis. The principal physical characteristic being sought in this material is resistance to mechanical injury, weed growth, and deterioration by exposure to soil elements.

Further information may be secured from The Cotton-Textile Institute. Or use the Request Card at page 16. Circle No. 112.

Units for Dispensing Air-Entraining Agent

The latest Darex AEA dispensers and air meters are presented in the 40-page catalog recently released by Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass. General descriptions, installation procedures, and operation methods are included in the bulletin and illustrated by line drawings or photographs.

The index is organized according to the various applications for the dispensers: central ready-mix or batching plants, pavers or mixers, portable job mixers, truck-mixers, and concrete-products plants. A number of types of fully automatic, semi-automatic, and manually operated dispensers are available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 121.

Eutectic Plant Opened

The new plant of Eutectic Welding Alloys Corp. in Flushing, N. Y., was formally opened on October 7, by severing a steel ribbon with Eutectic's Cut-Trode—an arc metal-cutting electrode.

Ceremonies were held in the plant's assembly hall. Professor Otto H. Henry of Polytechnic Institute of Brooklyn was the guest speaker, and Rene D. Wasserman, President and founder of Eutectic, described the company's research and development program.

Catalog on Power Sprayers

Roadside development engineers will find a complete line of power sprayers covered in the new Catalog PSC50 prepared by The F. E. Myers & Bro. Co., of Ashland, Ohio. The Myers line includes over a hundred different models and sizes, with provision for every kind of power-spray usage.

The Silver Cloud line includes: 2-wheel tractor-drawn engine and power take-off models with capacities up to 50 gpm and pressures up to 600 pounds; 4-wheel and skid-type engine-powered models of similar capacities and pressures; and portable and utility sprayers for all types of lower-capacity gun spraying. A full complement of sprayer accessories is also presented in the catalog. Descriptions, specifications, and illustrations of each model are included in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 108.

Data on All-Wheel Drives

A broadside describing an all-wheel drive designed and engineered specifically for Ford trucks is offered by Marmon-Herrington Co., Inc., Indianapolis, Ind. Both 4 and 6-wheel-drive truck models, with gross vehicle weights up to 35,000 pounds and wheelbase up to 196½ inches, may be converted. The circular gives all specifications and features. It also points out how the drive is installed to make it an integral and permanent part of each vehicle.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 117.

★★★★★★ SIX NEW ST

NEVER HAVE SO MANY NEW
ROAD MACHINERY MANUFA

Four New Motor Graders

Now a Size to Fit Every Job and Budget!

AD-4 22,140 lbs. . . . 104 brake hp. . . . GM 2-cycle diesel engine.

BD-3 19,042 lbs. . . . 78 brake hp. . . . GM 2-cycle diesel engine.

BD-2 17,772 lbs. . . . 50.5 brake hp. . . . GM 2-cycle diesel engine.

Model D 8,500 lbs. . . . 34.7 brake hp. . . . Allis-Chalmers gasoline engine. A completely new low-cost motor grader with exclusive tandem drive. Engineered new from the ground up to bring you BIG grader design and performance advantages.

Note— The popular Model AD-3, introduced just prior to the war, set the pattern for all these models. Provides 78 brake hp. . . . weighs 21,835 lbs. . . . has GM 2-cycle diesel engine.

Two New [illegible] Powered Tr

HD-19 With exclu[illegible] drive! Load [illegible] cally balanced—up to 25% [illegible] applications. Weighs 40,000 [illegible] 2-cycle diesel engine.

HD-5 Weighs 11,250 [illegible] hp. — GM 2-[illegible] Simple to service, easy to op[illegible] capacity. A great tractor w[illegible] Allied line.

These two new units, alo[illegible] used HD-7 and HD-10 tractors, [illegible] Chalmers crawler line.

Warning and Protection Provided by Guardrails

The features and uses of Flex-Beam guardrail are briefly described in a folder prepared by the Sheffield Steel Corp., 1938 Shepard Ave., Kansas City 3, Mo. This rail is made of semi-spring steel designed for toughness and resiliency. The deep corrugations give it beam strength, while the heat-treated bolts permit positive splices.

According to the manufacturer, each installation has a continuous, flexible beam action with high resistance to impact at all points along the surface of the rail. Individual sections are spliced by seven ⅝-inch high-carbon heat-treated machine bolts. The center bolt holds the rail to the post; any type of post may be used. If reflector buttons are desired they can be set into the 3-inch-deep corrugations. The catalog points out applications for both highway and bridge use.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 127.

All-Steel Utility Body

A 4-page folder on a new all-steel all-purpose utility body is available from Morrison Steel Products, Inc., 601 Amherst St., Buffalo 7, N.Y. These bodies, designed to fit any standard commercial ½ to 1-ton truck chassis, are available in four models. Specifications and general information for each of the models are included.

The Morrison utility body features a 48½-inch inside width, offset reinforced non-skid heavy-load floors, weatherproof compartments, convenient side boxes for tools and accessories, and a full line of special equipment including winches, derricks, reels, pipe vises, support jacks, etc.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 37.

Euclid Territory Changes

The Euclid Road Machinery Co. of Cleveland, Ohio, has made several changes in the territories of its district managers. Everett C. Dellen, Manager of the Atlanta territory since 1940, has been assigned to Denver, to cover Arizona, New Mexico, Colorado, and southern Wyoming. T. A. Cantrell, formerly District Manager in Buffalo, replaces Mr. Dellen in Atlanta; he will represent Euclid in Alabama, Georgia, Florida, and eastern Tennessee. H. W. Hiscox is now handling North and South Carolina in addition to Virginia and West Virginia.

STAR PERFORMERS Brought to You By Allis-Chalmers Since the War

THIS TYPE BEEN INTRODUCED BY ONE IN SO SHORT A TIME - - - - - - -

Here's proof that Allis-Chalmers plans far ahead to keep you ahead on your work! For it takes years of planning...building and rebuilding . . . testing and retesting . . . on each completely new tractor or motor grader.

What's more . . . A-C listens to you . . . incorporates *your demands*, as well as the forward thinking and design ideas of its own organization and Allied equipment manufacturers. This complete cooperation is behind every new Allis-Chalmers tractor or motor grader.

Compare the six new machines — feature by feature with any others — and you'll see why they are truly Star Performers. ASK YOUR ALLIS-CHALMERS DEALER FOR A DEMONSTRATION . . . NOW.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Originator of the Torque Converter Tractor

Concrete Subgrade High-Strength Paper

A concrete subgrade paper, known as Leatherback Subgrade, has just been announced by Protective Papers, Inc., of Union, Ill. Leatherback Subgrade, the company says, meets all specifications for a subgrade paper with AASHO designation M 74-38. It is an asphalt-saturated paper weighing a minimum of 40 pounds per 1,000 square feet; the asphalt content of the paper is at least 50 per cent of the weight of the untreated paper.

These papers are said to have a bursting strength of 40 pounds or more when dry, and at least 20 pounds after immersion in water for one hour at 70-80 degrees F. Tensile strength per inch of width of paper is 45 pounds in the machine direction and 25 pounds in the other direction, the company reports. Leatherback Subgrade papers are furnished in 36 and 48-inch rolls, each roll totaling 1,000 square feet.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 88.

Low-Bed Trailers

Four heavy-duty low-bed trailers in both level and drop-platform models, are offered by the Schertzer Equipment Co., 32 Prospect St., Somerville, Mass. Built of structural steel and welded at every point of contact, they are available in 15, 20, 25, and 30-ton capacities, with foot beds of 12½, 15, 16, and 18 feet respectively. They are 8 feet wide and have a 2-inch all-oak flooring.

Designed for transporting all types of heavy-construction machines, the standard equipment for these trailers includes: lights and reflector, three lashing rings on each side, skid rails on the rear, and a rear loading ramp. Westinghouse air brakes or vacuum booster brakes may be obtained.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 140.

For Locating Pipe

A new lightweight electronic pipe locator and leak detector, Model 87, is now produced by The Goldak Co., 1500 W. Glenoaks Blvd., Glendale, Calif. It weighs 11 pounds, can be operated by one man, and is designed to show the exact location of buried pipes, mains, services, gates, tees, ells, stubs, etc. A new type of electronic circuit is said to provide a strong location signal which gives the depth as well as location of lines. Standard material tubes and flashlight batteries are used.

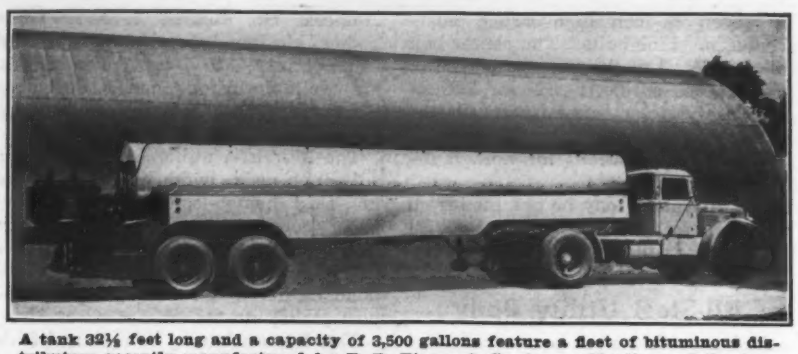
Further information may be secured from the company. Or by using the Request Card at page 16. Circle No. 135.

Chemical Brush Control

An 8-page illustrated booklet on the Davey chemical brush-control system has been prepared by the Davey Tree Expert Co. of Kent, Ohio. The chemical used in this work is Ammate, a non-selective killer of the tree growth, which is said to be non-toxic to operator, livestock, and wild life. When sprayed on foliage it kills by traveling through the leaves into the stem and down to the roots, causing the death of the root system as well as the surface branches.

Numerous applications of this service are illustrated with before-and-after photographs. The company explains that since the chemical kills by surface application, it is best applied to a well developed crop of leaves. It makes little difference, in the company's experience, just when the spraying is done, so long as the leaves are well developed and fall coloring has not yet begun.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 6.



A tank 32½ feet long and a capacity of 3,500 gallons feature a fleet of bituminous distributors recently manufactured by E. D. Etnyre & Co. to specifications of the Barrett Division of Allied Chemical & Dye Co.

Large Distributor Of Stainless Steel

What is said to be the largest bituminous distributor ever made using stainless-steel jacketing and heads has been designed and manufactured by E. D. Etnyre & Co. of Oregon, Ill. This Black-Topper carries 3,500 gallons and is basically an Etnyre FX-400 Style D distributor having low-pressure burners and a 24-foot full-circulating spray-bar with relieving sections. The tank proper is 32 feet 6 inches long with heating flues running its entire length. The equipment is mounted on a specially engineered highway tandem-axle semi-trailer.

A fleet of these distributors was delivered recently to the Barrett Division of the Allied Chemical & Dye Co. The units were constructed to that company's specifications.

Further information may be secured from Etnyre. Or use the Request Card at page 16. Circle No. 20.

Bulletin on Generators

A 4-page folder describing a line of complete, packaged power units in the form of diesel and gasoline-engine-driven generator sets, designed for emergency or continuous service, has been released by the International Diesel Electric Co., Inc., 13-02 Forty-Fourth Ave., Long Island City 1, N. Y. These sets range in capacity from 5 to 250 kw. Photographs show ten typical units to demonstrate the scope and application of these power plants.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 19.

The "HUSKY" All-Purpose Road Grader, Maintainer, Ditcher and Terracer

With or without Front End Control and/or Off-Set Hitch or with Hydraulic Controls if desired.

Larger rear wheels make for easier pulling and for better work.

It does so much and such better work it is hard to believe until you try it out. Unexcelled for contractors—leveling off and maintaining.

So strong all parts, except tires, guaranteed against breakage for one year regardless of how or why, and the wheels are over-tired to prevent skidding and washboarding. Much larger tires than recommended by tire companies but this greatly increases the efficiency.

Manufactured by

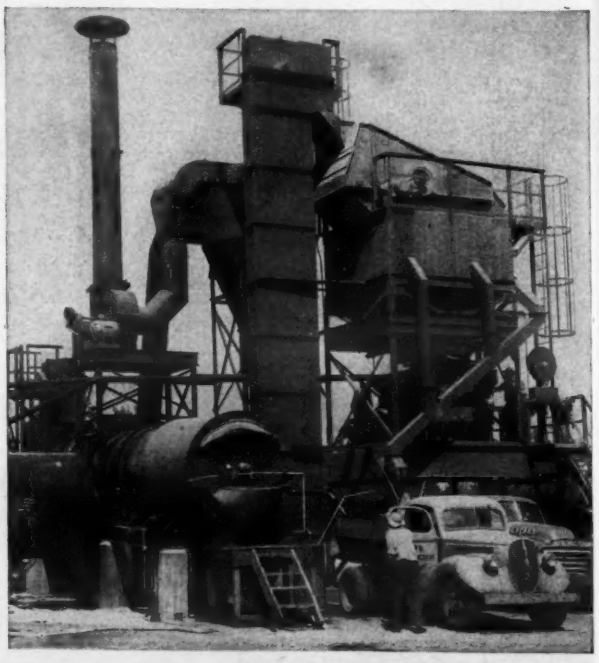
NORTHFIELD IRON COMPANY P.O. Box 30-A Northfield, Minn., U.S.A.

CUMMER ASPHALT PLANTS

***New* PORTABLE and STATIONARY**

Only 12 hours for complete assembly

1-TON PLANT



FEATURES

- **Mobility and ease of transportation (portability)**
- **Complete weight—only 43 tons**
- **All moving parts individually motor driven eliminating all chain and belt drives**
- **Capacity—Guaranteed 50 to 60 tons per hour Based on 5% initial water content, dried to within ½ of 1% and heated to 350 degrees to 400 degrees Fahrenheit**

Can be furnished with own axles and pneumatics

Sizes from 25 to 100 tons (drying and mixing units) available

PROMPT SHIPMENT OF ALL SIZES

Feeders — Storage Bins — Pumps — Timer

Literature on Request

THE F. D. CUMMER & SON COMPANY

BUILDER OF FINE ASPHALT PLANTS

Cleveland 15, Ohio USA

Seaboard Construction Co. and C. & E. M. Photos

The Caterpillar No. 12 motor grader at left shapes a sand-asphalt base course on a Georgia secondary road. Above, an International ID-9 rubber-tired tractor pulls a Killefer harrow over a windrow to break up any lumps and "cure it out."

Sand-Asphalt Base Is Mixed on Road

Carried Through Winter Under Traffic; Reshaped In the Spring and Topped With Surface Treatment

✦ AT the extreme southeastern tip of Georgia, in Camden County, a 5-mile stretch of bituminous pavement has been constructed as a secondary road with state funds. What had been a rough-riding 12-foot sand road, at times impassable, is now a smooth, 18-foot black-top highway flanked by 5-foot shoulders. The new road takes off State Route 40 near St. Marys Airport, and runs northeast to Elliotts Bluff Road which leads to Crooked River State Park. The 5-mile improvement extends almost to the coast line at Crooked River, a potential recreational area.

A contract for building the highway was given to the Seaboard Construction Co. of Brunswick, Ga., at a cost of $139,500. The plans for the project and the engineering supervision were handled by the Georgia State Highway Department. In addition to the grading, drainage, and paving, the project included two timber bridges, each 60 feet long, made up of four 15-foot spans. Drainage is taken care of by reinforced-concrete pipe, except in one instance where a reinforced-concrete culvert was required. This box structure, 6 feet high x 8 feet wide, measures 32 feet in length.

Grading Operations

Work got under way in August, 1948, and the road was officially accepted last May. The first operation consisted of clearing the brush and small growth off the new right-of-way which had been widened to 80 feet. This was done by two Caterpillar tractor-dozers—a D8 and a D7. Then the new roadbed was constructed over the marsh, and 741 linear feet of 18 to 36-inch pipe was laid for drainage. The bridges were built and also the culvert. The roadbed is practically all fill, averaging 3 feet in height. The 5-foot shoulders included in the 28-foot roadbed slope at the rate of ⅓ inch to the foot. From the edge of the shoulders, the side slopes go down 3 to 1 to a 4-foot-wide flat-bottom ditch. Backslopes are 2 to 1.

(Continued on next page)

THE NEW LOOK
for the
MIGHTY MIDGET

BREAK WITH POWER, SPEED, ECONOMY

The MIGHTY MIDGET reduces the cost of breaking asphalt and concrete to a minimum cost that is unequalled by other methods. Tamps backfill at an unbelievable pace; gives high density. All controls within operator's reach.

Write for information to Dept. C.

R.P.B. CORPORATION
2731 EAST 11th STREET • LOS ANGELES, CALIFORNIA

Snow—Sleet—Blizzards—Drifts—Ice...

Every Winter Storm is an Emergency!

● 250 hp. WALTER SNOW FIGHTER with giant V-Plow and two side wings, hydraulically controlled. Total clearing width 28 ft., at 20-30 mph.

Be ready with equipment designed to meet ALL emergency requirements—

WALTER
4-POINT POSITIVE DRIVE
SNOW FIGHTERS

One-piece Snow Removal "Fleet"!

● 240 hp. Walter Snow Fighter equipped with Front Plow, Speed Wing, Center Scraper and Sand-Chemical Spreader Body. This single unit clears snow at 20-30 mph., widens and levels snowbanks — scrapes hard-packed snow — automatically spreads sand and chemicals at high speed to control icy pavements. Investigate!

KEEPING WINTER ROADS OPEN is a many-sided problem. Why risk your safety by using "single-purpose" equipment designed for other work? Build your winter maintenance program around big, fast, powerful Walter Snow Fighters—specially designed to handle ALL winter road conditions.

Look what you get with Walter Snow Fighters! High speed to clear more miles per hour; tremendous power for widening and drift busting; exclusive Four Point Positive Drive with 100% traction for non-slip, non-stalling operation; rugged construction for gruelling service. Plus many combinations of V-plows, front plows, side wings, center scrapers, sand-chemical spreaders to quickly overcome every road hazard.

See the latest Walter Snow Fighters at your dealer. Ask for a demonstration. Detailed literature sent on request.

WALTER MOTOR TRUCK CO., 1001-19 Irving Ave., Ridgewood 27, Queens, L.I., N.Y.

Seaboard Construction Co. Photos

Seaboard Construction Co. used the Barber-Greene continuous-mix traveling plant pictured above on its sand-asphalt base job in Georgia. At right are the asphalt storage tank and the Cleaver-Brooks 3-inch pump employed on the contract.

Sand-Asphalt Base Is Mixed on Road

(Continued from preceding page)

Material for the roadway fills came from two sources—the ditches and borrow pits. The dozers shaped the ditches and pushed the dirt up on the roadbed. Two roadside borrow pits were the chief suppliers of whatever else was necessary. Two draglines were used in the pits—a Link-Belt and a Bay City—both equipped with 35-foot booms and Page ¾-yard buckets. The sandy material was hauled out in 3-yard dump trucks, then spread and compacted on the road by the dozers. Grading was completed by the end of November, 1948.

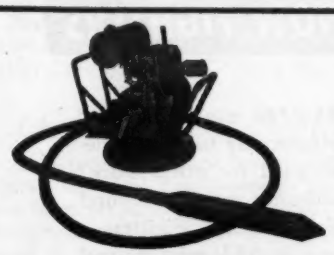
Sand-Asphalt Base Course

As the grading advanced, the 6-inch sand-asphalt base course followed right behind. The sandy subgrade material was shaped into a windrow by two Caterpillar No. 12 motor graders. At the base the windrow was 6 feet wide, with 2 to 1 side slopes and a 4-foot top width. The windrow was then straddled by a Barber-Greene continuous-mix traveling plant that mixed the sand with RC-1 asphalt at the rate of 3.8 gallons to the square yard of finished base.

The bitumen was supplied by The Texas Co. and was hauled 42 miles in 5,000-gallon transport trucks from Jacksonville, Fla., to the west end of the job at St. Marys Airport. Here a 14,000-gallon storage tank was set up, and a Cleaver-Brooks 3-inch pump unloaded the trucks. No heating was required, as the RC-1 was used at air temperatures. When the road-mix operations were in full swing, as many as four transports were employed in hauling bitumen to the storage tank. From this tank the traveling plant was supplied by service trucks with 1,100-gallon tanks.

The mixed windrow of sand-asphalt was then worked back and forth across the road by the two motor graders and shaped to a 3-inch center crown. The

(Concluded on next page)



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ASPHALT PLANTS
Portable — Stationary
Write for Circulars

White Mfg. Co.
ELKHART INDIANA

Here is Airco's **New** Torch for
Heavy Duty welding...
heating...brazing

The new Airco 800 Torch is designed for tough, *heavy-duty* jobs. As shown in the illustration, the torch operates with a complete range of welding tips (with or without individual mixers) as well as heating, brazing and a variety of tips for other uses. No other torch can offer this wide operating range.

The torch head is of durable, long-wearing monel metal; thus fewer torch head replacements, and lower maintenance costs result. The general design of the new Airco 800, plus flexible 1/4" or 5/16" I.D. hose, assures perfect balance and ease of manipulation . . . lowered operator fatigue.

With the addition of a cutting attachment, the Airco 800 is easily converted to handle general shop cutting work.

If you would like more information about this torch, or a FREE demonstration right in your own shop, address Dept. OG-8471, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Company, Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.

AIRCO **AIR REDUCTION**
Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

6-inch base was compacted by a Tampo rubber-tire traffic roller pulled by an International ID-9 rubber-tired tractor. Mixing in the windrow started September 30, 1948, and by December 6, the base course was completed. However, it was then too late in the year for the single surface bituminous treatment to be applied. But the base course presented a smooth, hard surface for the use of traffic throughout the winter months. So work on the paving phases of the project was suspended for a few months until spring, when the base was worked over and reshaped, and then sealed with the surface treatment.

Sprigging

During the mild 1948-1949 winter the shoulders and slopes were dressed and trimmed by a D6 tractor-dozer and the two motor graders. Then the entire job was sprigged in furrows one foot apart, beginning one foot off the edge of pavement and extending out to the toe of the front slope. This averages an 18-foot strip on each side of the highway. The strips were smoothed over with an 8 x 8 timber drag 12 feet long, pulled by a Fordson rubber-tired tractor. When the drag had passed, a 6-8-4 fertilizer was applied at the rate of 600 pounds to the acre by an International distributor pulled by a horse. Sprigs of Bermuda grass were dug out of nearby fields and planted in rows one foot apart. A final application of nitrate of soda was given at the rate of 300 pounds per acre.

On the first day of spring, work on the pavement was resumed. The base course was torn up, a section at a time, and re-worked so as to "cure out" any naphtha and moisture remaining in the sand-bituminous mix. First the scarifiers on the motor graders dug into the hard-packed 6-inch base. This was followed by passes from a John Deere Killefer disk harrow and a Seaman Pulvi-Mixer; the machines were pulled by the rubber-tired tractors. Then the graders pulled the material over to the center of the road in a windrow where it received further going over by the harrow until all the lumps had been reduced to a fine consistency. When the base-course material was thoroughly cured, the graders re-shaped it over the roadbed to a width of 18 feet 6 inches. This extends 3 inches beyond the surface-treatment pavement on each side.

Once more the base was compacted by the rubber-tire roller, and shaped to conform to the crown of the road. This was continually checked with a wooden template—a 2 x 8, 18 feet long, that was cut out to the ⅓-inch to the foot crown.

Single Surface Treatment

AC-15 asphalt for the surface treatment was hauled in tank cars from Savannah, Ga. The asphalt was applied to the base course by an Etnyre 1,350,-gallon distributor at the rate of 0.35 gallon to the square yard. The full width of 18 feet was shot at a time.

The asphalt was then covered with 32 pounds per square yard of No. 4 slag which is graded from ¾-inch down. The Birmingham Slag Co. of Ansley, Ala., shipped the slag by rail to the Seaboard Railway siding at St. Marys, ¼ mile from the west end of the job. A Bay City crane with a ¾-yard clamshell unloaded the gondola cars to a fleet of six Ford 3-yard trucks which hauled the cover aggregate to the road. The slag was laid down by a Buckeye spreader, hooked to the tail-gate of the unloading truck, in two 9-foot lanes. The finishing touch was rolling by the rubber-tire roller.

This portion of the work proceeded at a brisk pace, with an average of 2 miles of surface treatment per day. Ordinarily, if the job had been done entirely during the spring-summer-fall construction season, the base course would have cured out with normally warm weather as it was being placed. Then there would have been no need for tearing up the base, working it over, and re-shaping it as was the case on this particular contract. However, by starting the job last fall, the State assured motorists of a hard-surface base to ride over through the winter, whereas the old road was usually in bad shape during those months if not entirely impassable.

Quantities and Personnel

The major items in the 5-mile contract included the following:

Sand-asphalt road-mix base course	52,000 sq. yds.
Single bituminous surface treatment	52,000 sq. yds.
Clearing and grubbing	48 acs.
Concrete pipe, 18 to 36-inch	741 lin. ft.
Excavation, common and borrow	63,000 cu. yds.
Sprigging	62,500 sq. yds.

The Seaboard Construction Co., of which H. J. Friedman is President, employed an average force of 15 men on the project under the direction of Wiley Goff, Superintendent.

For the Georgia State Highway Department, C. P. Chapman was Resident Engineer, and O. C. Williamson was Inspector. The Department is headed by Jim L. Gillis, Director, with M.L. Shadburn, Chief Engineer. J. O. Bacon is Division Engineer at Savannah, the Division in which this highway project is located.

Makes Bucket Equipment

The recently formed Baer Steel Products Co., Inc., has finished installing machinery in the shops of its new plant building at Auburn, Wash., and production is going full tilt. The company makes dragline, dipper, and hoe buckets, as well as replaceable teeth. It also operates a repair service for buckets, booms, and allied construction equipment.

Joe Baer, owner and manager of the firm, is well known for improvements he developed in excavating equipment while he was Chief Designing Engineer with Esco and, before that, with Bucyrus-Erie. The front castings of his custom line of brackets and all replaceable teeth are made of Fibraloy steel.

WHAT DO YOU WANT IN A PUMP?

Consider this GORMAN-RUPP 15 M-3 inch PUMP

FAST PRIMING!
This Pump Primes at 25 foot Suction Lift in 61 seconds.

HIGH PRIMING!
Gorman-Rupp featured High Priming in demonstrating pumps at the Road Show.

HANDLE DIRTY WATER!
This Pump will handle whatever muck passes the suction strainer. There is nothing to clog.

DEPENDABILITY!
Always the most simple design -- always the most in dependability.

MADE IN ALL SIZES 7M - 10M - 15M 20M - 30M - 40M 90M - 125M

Gorman-Rupp Pumps meet A.G.C. standards in every respect. Every Pump fully guaranteed.

Write for the new Contractors' Bulletin 8-CP-11.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

AN AMAZING LUBRICANT!

LUBRIPLATE 130-AA

Protects against RUST AND CORROSION

A super grease-type lubricant! — A marvelous anti-seize compound and a real protector against rust and corrosion. From the standpoint of general utility and diversity of important uses LUBRIPLATE 130-AA is unequaled. While it is ideal for the heaviest loads, this remarkable lubricant does not cause drag and actually conserves power. Write for a free copy of the LUBRIPLATE Service Hand Book.

℞ FOR YOUR MACHINERY

No. 2 — Ideal for general oil type lubrication, ring oiled bearings, wick feeds, sight feeds and bottle oilers.

No. 8 — Because of high film strength and long life it reflects outstanding performance in most types of enclosed gears (speed reducers).

No. 107 — One of the most popular grease type products for general application by pressure gun or cups.

No. 70 — For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA — Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

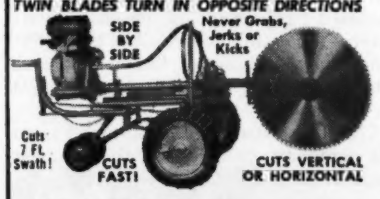
BALL BEARING — This is the LUBRIPLATE Lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.

LUBRIPLATE
FISKE BROTHERS REFINING CO.
NEWARK 4, N. J. TOLEDO 9, OHIO
DEALERS FROM COAST TO COAST
CONSULT YOUR CLASSIFIED TELEPHONE BOOK

JACOBS SAFETY WONDER SAW

WORLD'S GREATEST SAW INVENTION

TWIN BLADES TURN IN OPPOSITE DIRECTIONS



FOR RIGHT-OF-WAY CLEARING

The greatest brush and timber clearing saw invention in America. No other saw ever built can equal its operating advantages and features. Self-propelled. Hydraulic oil transmission drive. Saw in horizontal position swings to cut 7 ft. swath.

WRITE FOR FREE FOLDER!

JACOBS WIND ELECTRIC CO., INC. Industrial Division Minneapolis 11, Minn.

The scaffold-bearing hoist on this Wagnermobile lift truck will extend 62 feet. It folds to 12 feet 8 inches over the cab of the truck.

Scaffold Lift Truck

A new type of lift truck has recently been designed by the Mixermobile Manufacturers, 6855 N. E. Halsey St., Portland, Oreg. Built on Government order, the machine has a telescope lift that features a scaffold rather than earth-moving or concrete-work attachments. Set on the Wagnermobile tricycle chassis, the compact scaffold-bearing hoist folds to 12 feet 8 inches over the cab of the unit. The hoist nested is only 20 feet in height but will extend to 62 feet—the highest extension ever attempted on any type of lift-truck equipment, the company says.

The unit is powered by a 92-hp Hercules diesel engine and is hydraulically operated except for the cables which lift and lower the hoist. The scaffold itself is approximately 3 x 12 feet between guardrails. It was designed for use by two men but can be enlarged to accommodate more. Its safety feature is a remote-control lever which enables workers to lower themselves as they work, or in case of emergency.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 89.

Zoning Your Hauling Job

A fully illustrated bulletin titled "Zoning the Job" has been prepared by the Caterpillar Tractor Co., of Peoria, Ill. It points out that earth-movers the world over are proving the importance of zoning jobs for maximum production at the lowest possible cost. When cost curves intersect, haulage methods should be reviewed and carefully considered. The folder describes the problems and solutions of five contractors who have used Caterpillar equipment on their work.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 114.

Rock-Drilling Steels

A 16-page booklet discussing the essentials of good drill steel is offered by the Crucible Steel Co. of America, 405 Lexington Ave., New York, N. Y. The introduction to this catalog explains that the Crusca brand of hollow and solid drill steel is designed to meet all requirements and applications in rock drilling, quarrying, and construction work. These steels, it points out, are made in all standard shapes.

The essentials of good drill steel are discussed under the following headings: resistance of the cutting edge to shock and of the reaming edge to abrasive wear, resistance to fatigue, uniformity of analysis and structure, the hole in hollow steel, stiffness, and accuracy of section.

Though Crusca is a rugged steel, says the manufacturer, it is nevertheless a high-grade tool steel, and as such its usefulness can easily be destroyed by careless or improper handling during heating, forging, and hardening. Therefore, the catalog includes suggestions for proper heating, forging, hardening, and shop inspection of the drills. It also lists standard stock sizes and weights of hollow drill steel in sizes from ⅞ inch to 1½ inches, and solid drill steel in sizes from ½ inch to 2½ inches.

This literature may be obtained from the company, or by using the Request Card on page 16. Circle No. 29.

Pavement Performance And Maintenance Costs

Highway Research Board Bulletins No. 20 and 21 deal with pavement performance and maintenance costs, respectively. Bulletin 20 contains a paper by A. T. Bleck reporting on a survey of 3,000 miles of pavement in which pavement conditions were correlated with their environment. Factors studied were cracking, faulting, pumping, and blow-ups of rigid pavements; base courses for bituminous pavements; moisture conditions; traffic loads and climate; and sub-base courses. Another paper, by T. E. Shelburne and A. W. Maner analyzes road performance data collected at the time of the spring break-up on 1,000 miles of primary and nearly 5,000 miles of secondary roads in Virginia.

Bulletin 21 contains the HRB committee report on maintenance costs by Chairman J. S. Bright; a paper by J. J. Forrer comparing costs of ditch cleaning by hand labor and by mechanical loaders; and a report on the economics of resurfacing disintegrated pavements, by C. Owen Beckley.

Copies of both bulletins can be obtained by writing to the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. Bulletin 20 costs 90 cents; Bulletin 21 costs 15 cents.

Bulletin on Conveyor Chains and Sprockets

Conveyor chains and sprockets are fully illustrated and described in a new 28-page bulletin, No. 29, just released by the Diamond Chain Co., Inc., 402 Kentucky Ave., Indianapolis 7, Ind. The chains are made in pitches ranging from 1 to 4 inches, with standard and large rollers. Standard attachment links; extended pins; and stainless-steel, bronze, and top plate chains along with appropriate sprockets are also treated in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 18.

LITTLEFORD
Tankar STEAM HEATER
model no. 115
provides steam in two minutes time
FROM A COLD START Here's a steam producing unit for Unloading Tank Cars that gives 200 lbs. of steam pressure in two minutes time. It is the fastest steam producing unit on the market today. It's designed to unload tank cars of Asphalt, Tar, Emulsions, Cutback, etc., yet can also be used for cleaning, thawing, pile driving, heating buildings, winter concrete curing and ore mining.
COMPLETELY AUTOMATIC—there's no steam producing unit that heats as fast, is as safe and foolproof as the "Tankar" Steam Heater. It's automatic in feeding the water, stopping the burner, controlling the temperature and steam output and lighting the burner. The Littleford "Tankar" Steam Heater is small, compact, light weight and is mounted on Pneumatic Tired Wheels for fast trailing. Secure more information on this amazing steam producing unit from your nearest Littleford distributor.
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Master Red Seal Power Blow Electric Hammer & Spade Catalog No. 688
Portable Gas-Electric Generator Plants. Sizes 500 to 17000 Watts. Catalog No. 815
Also Continuous Duty and Emergency Stand-by Plants 20 to 100 KW. (Apply to Dayton for quotations.)
Model 650, D.C. Generator Plant. 500 Watts continuous duty, 650 Watts intermittent duty. Mounted on Model 98 Buggy.
Model 2500, D. C. Generator Plant. 1500 Watts continuous duty. 2000 Watts intermittent duty. Mounted on Model 83 Buggy.
Gasoline Engine Backfill Tamper Catalog No. 699 Revised
Model HP-1 Hot Tamper Plate used with Backfill Tamper
Clay and Shale Spade
Asphalt Cutter
REDUCE COSTS with STURDY, DEPENDABLE
MASTER PRODUCTS DESIGNED FOR THE JOB
Every feature necessary for top performance is included as standard equipment with Master Products. ON THE JOB PERFORMANCE COUNTS. Buy right — Buy Master for sure profits and low maintenance costs.
DON'T DELAY — Write today for illustrated catalogs on Master Products.
MASTER VIBRATOR COMPANY, 110 Davis Ave., Dayton, Ohio
Electric Motor Driven Concrete Vibrator. Catalog No. 783C
Gas or Electric Turn-A-Trowell Sizes 34" or 48" Catalog No. 939
Gas or Electric Combination Disc Float and Turn-A-Trowell Catalog No. 939
Concrete Surfacing Attachments
Gasoline Engine Driven Concrete Vibrator Catalog No. 783C
Vibratory Concrete Finishing Screed Sizes 6' to 36' Catalog No. 942

Heavy Plows Tackle Heavy Alaska Snows

Alaska snow is wet and heavy in the 19-mile section of Richardson Highway over Thompson Pass. And dense fog shrouds the highway most of the winter. But the road must be kept open because it connects Valdez with the Alcan Highway and Fairbanks—and Valdez, the farthest-north year-round port in Alaska, provides the shortest direct route to interior towns and military bases.

This winter, the Alaska Freight Lines, with the help of the Alaska Road Commission, is keeping the highway open—"Operation Snowball", they call it. And spearheading the operation are two special snow plows built for Alaska Freight by Pacific Car & Foundry Co., of Renton, Wash.

The Carco plows are mounted on Kenworth 20-yard Model 888 trucks. Two Bros rotary plows mounted on Kenworths, and 4 Allis-Chalmers HD-19 tractors with Carco dozers complete the equipment line-up. Alaska Freight furnished the plows, the Alaska Road Commission the tractors. Sound Equipment Co., Inc., Seattle, made all arrangements for procuring the machines.

Twelve or fifteen men will be on the job all winter. John Clark of Alaska Freight is acting as Superintendent, while Ben Stewart, Superintendent of the Valdez Department of the Alaska Road Commission, is supervising the Commission's part of Operation Snowball.

This rig ought to be a match for Alaska snows—a specially built Carco snow plow mounted on a Kenworth 888 dump truck. Alaska Freight Lines is using two such outfits this winter for snow removal on Richardson Highway. Here, at the time of delivery, are Alfred Ghezzi (left), President of Alaska Freight, and R. R. Harrup of Sound Equipment Co., which arranged for the procurement of the equipment.

Hydraulic Trencher

The new Ware Hydro-Trencher is an all-hydraulic backhoe with double-acting cylinders, designed for use with Oliver industrial 77 and 88 tractors. It is manufactured by Ware Machine Works, Inc., of Ware, Mass. This trenching attachment is said to reach a distance of 18 feet beyond the center line of the rear tires, and to dump up to 100 degrees on either side of the rear position. It has a ½-cubic-yard bucket capacity and a maximum digging depth of 9 feet 6 inches. Cylinder lifting capacity is 10,000 pounds.

An 18-inch bucket is available for the Model 77 and a 20-inch for the 88; a special 22-inch model is also made. Two hydraulic outriggers are designed to provide a sturdy base for the unit and remove strains from the tractor while digging. The front of the tractor is held in place by counterbalancing weights. The boom is hydraulically operated and swings to either side allowing placement of earth in any desired location. The backhoe can be changed to a conventional shovel bucket for loading operations, or the entire trenching unit can be removed and the tractor used for other duties.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 123.

Concrete Accessories

A 56-page catalog discusses the services and accessories for concrete construction offered by Superior Concrete Accessories, Inc., 4110 Wrightwood Ave., Chicago 39, Ill. It groups form ties and clamps by types of construction: ordinary foundations, engineering structures, watertight walls, and architectural concrete. It also describes form hangers, anchors, chairs, bolsters, spacers, and highway dowel bar supports. All pertinent information on the material, fabrication, application, and specifications of each item is given, along with illustrating photographs and engineering drawings.

The catalog includes tables of concrete pressures in forms at summer and winter temperatures; recommended safe spacing of studs and wales; and safe spacings of form ties, grouped by sizes of form lumber and safe tie capacities. These data are simply presented, for quick and easy reference.

Superior also offers a special engineering service that includes the preparation of form layouts, estimates, and quotations without cost to the contractor, the catalog explains.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 157.

Oliver District Manager

Oliver Corp. industrial business in Minnesota, North and South Dakota, northern Wisconsin, and the Canadian provinces of Manitoba and Saskatchewan is now under the supervision of R. L. Jones, District Manager with headquarters in Minneapolis. Jones was at one time associated with The Cleveland Tractor Co. before it was taken over by The Oliver Corp.

COMPLETE
WELL POINT SYSTEMS
WILL DRY UP ANY EXCAVATION
Faster—More Economically
Write for Job Estimate and Literature
COMPLETE
MACHINERY & EQUIPMENT CO., Inc.
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36-40 11th St., Long Island City, N.Y.
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GMCs "Deliver the Goods"

Food, furniture and fuel oil . . . the tree, the turkey and the toys . . . almost everything that moves by motor truck makes its contribution toward a Merry Christmas.

Total truck tonnage has increased 120 percent in the past ten years and GMC has been a pacemaker in this rapid rise in truck transportation. Now better equipped to "deliver the goods" than ever before, tough, truck-built GMCs offer powerful, valve-in-head gasoline engines or famed, 2-cycle Diesel models . . . strong, sturdy chassis with rugged axles, springs and brakes . . . big, wide-vision, easy-riding cabs . . . outstanding performance and dependability, unexcelled efficiency and economy.

There's a better-built GMC for all hauling jobs . . . for every transportation task . . . Christmas time and all the time!

GMC TRUCK & COACH DIVISION • GENERAL MOTORS CORPORATION

GMC
GASOLINE • DIESEL
TRUCKS

New construction is a "Christmas present" for the entire nation. GMC's complete line, ranging from Pickups to big brutes of over 90,000 pounds GCW, is completely capable of performir every hauling job in the construction indus

Here we see a 10-foot Overman spreader laying a 9-foot strip of asphalt by using cut-off plates. No ragged edges are left, it is reported.

Material Spreader

A new lightweight spreader for laying various bituminous mixes, and for placing stone, gravel, or shale on a bituminous base, is offered by the I. J. Overman Mfg. Co., 3301 S. Torrance St., Marion, Ind. This spreader, with roller follower, is available in three models. Spreader width of 8 feet 4 inches, 9 feet 4 inches, or 10 feet 4 inches may be had with the S8, the S9, and the S10, respectively. The width of lay can be cut off every 6 inches from either end of the hopper by using cut-off plates. The depth of lay can be controlled from 5 inches to a feather-edge.

The follower rollers are adjustable at the center to conform with the road crown. Cast-iron solid-rubber-tired front wheels are 16 inches in diameter and have a 4-inch width. The wheels can turn 32 degrees, right or left. The 3-ton hopper is of all-welded construction and has a 9-inch bottom opening. The spreader uses a chain hitch with single-tree action. This connection has a tendency to lift the front of the spreader when the going gets tough, but if the proper length of chain is used, the front wheels will not leave the ground.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 82.

Two New Floodlights

Two new heavy-duty general-purpose floodlights have been announced by General Electric's Lighting and Rectifier Divisions, Schenectady 5, N. Y. The new lights, the Type L-84 rated at 500 watts and the Type L-85 rated at 1,000 watts, are available either for general lighting service or floodlighting service lamps. A complete range of NEMA types 1 through 5 is provided. The door, hinged for easy relamping, uses three simple swing-type door latches. A clamping handle permits vertical adjustments so that the floodlights can be serviced completely without the use of tools.

An auxiliary reflector of finished aluminum provides high beam efficiency. The floodlights can be obtained with either narrow-beam polished or wide-beam etched reffectors. Both are available in three standard mountings, including a portable base.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 65.

Bulletin on Fasteners

"Fasteners", Volume 6, No. 1, containing four papers on fasteners and fastening operations, has recently been issued by the Industrial Fasteners Institute, 3648 Euclid Ave., Cleveland 15, Ohio. The subjects of the papers are as follows: specialty fasteners or gadgets produced by the cold-heading industry; bolted joints under fatigue loads; tightening characteristics of nut and stud assemblies; and the optimum preload on a bolt which will give it maximum life. This last paper is called "How Tight Is Too Tight?".

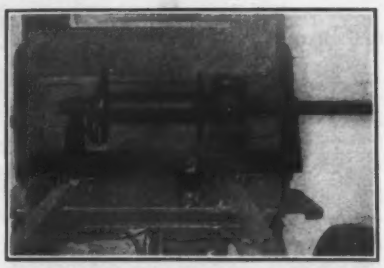
The Industrial Fasteners Institute was previously known as the American Institute of Bolt, Nut, & Rivet Manufacturers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 27.

Steel-Drum Winch

A new drag-brake winch has been placed on the market by The Adams Engineering Co., 1969 E. 119th St., Cleveland, Ohio. This Model M-18-DS Adaloy winch is designed to handle loads up to 18,000 pounds. As protection against shocks and heavy loads, it has a large pitch worm and gear.

A feature of the Adaloy winch is the improved drag brake and clutch assembly. The hardened steel detent engages the self-locking clutch for safety.



The Model M-18-DS Adaloy is designed to handle loads up to 18,000 pounds. It features an improved drag brake and clutch assembly.

The self-aligning drag brake provides a constant predetermined drag, according to the manufacturer. The flush-type cable clamp is designed to give an even layer of cable for the full length of the drum.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 136.

Data on Aluminum Ladders

Alco-Lite aluminum ladders are described in a new folder offered by the Aluminum Ladder Co., of Worthington, Pa. Folding step ladders, folding platform ladders, warehouse ladders, straight ladders, and extension ladders are presented. Their weights and dimensions are given in tables of specifications. Illustrations and prices of each of the models are also included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 49.

Long-Life Dependabilit

from Officials

Distinguished Service 1930-1949

Mr. Perley Dodge proudly poses with the Model 101 Adams Motor Grader, which last March completed 19 years of continuous service for Columbia County, Wisconsin. Throughout all these years, Mr. Dodge was sole operator of the machine. He and the Model 101 were teamed together for approximately 39,000 working hours. During all this time the machine required only normal maintenance—a high tribute to its rugged dependability.

Above is part of Columbia County's fleet of current-model Adams Motor Graders working on a typical oil-mix job.

The Model 101 is but one of the 21 Adams Mo Graders purchased by Columbia County since 19 Of these, 19 are still in daily operation—6 having be in continuous service for more than 10 years.

All of Columbia County's Adams Graders are constant use the year around. Warm weather finds th engaged in a diversity of operations—grading, dit ing, bank sloping, oil mix, gravel spreading, r maintenance, etc. In winter they serve as fast, effici machines for keeping county roads open and s free from snow and ice.

Yes, Adams' long-life dependability has paid off i big way for Columbia County—just as it will for y once you put these great motor graders to work.

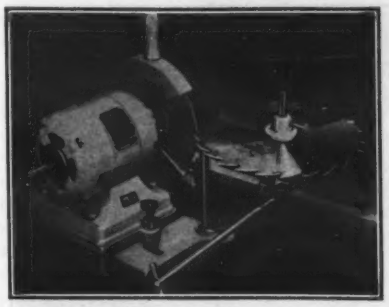
ONLY ADAMS OFFERS ALL THESE OUTSTANDING ADVANTAGES

• Eight Overlapping Forward Speeds • High-Arch Front Axle for Clearance • Push-Button Starting from Cab • Positive Mechanical Controls • Wide Range of Blade Adjustments • Exceptional Blade Clearance in All Operating Positions • Balanced Weight Distribution • Easy Access for Fast Servicing • World-Wide Dealer Service

Saw-Gumming Machine

A new powered saw-gumming machine designed to cut grinding costs is manufactured by the Belsaw Machinery Co., 315 Westport Road, Kansas City 2, Mo. With this machine the contractor can do his own jointing, gumming, tooth forming, and sharpening of both rip and cut-off circular saws. The tool will handle all types of circular saws 6 to 48 inches in diameter with ½ to 2-inch center holes.

The machine is powered by a ¼-hp motor operating on 110-volt 60-cycle ac power. Resinoid saw-gumming wheels, 8 inches in diameter, are designed for use with the Belsaw machine. These wheels are round-face Bakelite resin-bonded, medium grit, tested for safe use at the 3,450-rpm motor speed. The company points out the the ordinary vitrified wheels should not be used at this speed in larger than 6-inch diameter.



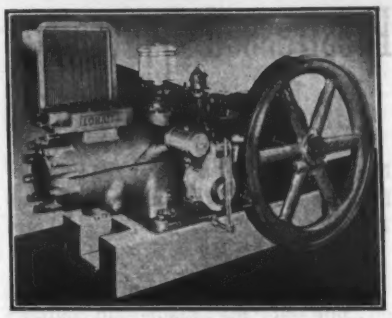
For saw maintenance—the Belsaw powered gumming machine. It does jointing, gumming, tooth forming, and sharpening of rip and cut-off saws.

An extra bearing retainer and locking nut are furnished for one end of the threaded shaft to permit the use of the grinding wheel as a bench grinder, for flexible-shaft work, etc.

Further information on this saw-gumming machine may be secured from the company. Or use the Request Card at page 16. Circle No. 76.

Piling Co. Changes Name

Corr-Plate steel piling is now being manufactured by Caine Corr-Plate Piling Co., 2535 S. State St., Chicago 16, Ill. This organization consists of Irvin W. Caine, Harmon L. Caine, and Arthur B. Mayer.



White-Roth Machine Corp. has developed two new horizontal-type single-cylinder two-cycle engines—Lorain Models R and A—as companion power plants to the Lorain L and O engines.

Two-Cycle Engines

Two new horizontal-type single-cylinder two-cycle engines have been developed by the White-Roth Machine Corp. of Lorain, Ohio. Designated as the Lorain Model R and Model A engines, the units are identical except for cylinder bore and brake horsepower output. The Model R, with 12-inch bore and 13-inch stroke, produces 45 bhp at 325 rpm; the Model A, with 13-inch bore and stroke, produces 55 bhp at the same speed.

Designed as companion power plants to the Lorain L and O engines, both models have tapered-roller-bearing crankshafts and auxiliary shafts. Wet-sleeve cylinder liners of alloy cast iron are designed for long life and easy replacement on location. The Model R engine operates on natural-gas fuel only. Model A can be operated as a cold-starting full diesel or converted to burn natural gas or butane. Conversion is quickly accomplished in the field, the manufacturer says.

A condenser-type cooling system eliminates the need for a water pump and make-up water is negligible. Standard equipment includes a Twin Disc clutch, Pierce governor, Air Maze oil-bath cleaner, McCord lubricator, and built-in 7½-hp Lorain gasoline starter. Overall dimensions are: length, 110 inches; width, 74 inches; height, 68 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 81.

Four-Wheel-Drive Trucks

A broadside describing construction features and service of Oshkosh four-wheel-drive trucks is available from Oshkosh Motor Truck, Inc., Oshkosh, Wis. These trucks, the catalog points out, are especially designed for heavy-duty work such as snow removal, road building, and maintaining. Engineering features and component parts of these trucks are illustrated by photographs and cut-away diagrams. The company points out that these trucks are constructed so that any type of auxiliary equipment can be readily mounted on their chassis.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 32.

Wire Rope and Strand

Detailed information on Bethlehem wire rope and strand is presented in a 100-page book offered by the Bethlehem Steel Co., Bethlehem, Pa. The different grades of steel, kinds of core, and types of construction are briefly described to give the user an idea of the factors involved in selecting a wire rope for any particular task.

The book is divided into four sections dealing with the important features of Bethlehem wire rope; specifications, typical cross sections, and descriptions of wire rope and strand; elements of wire rope; and fittings for wire rope and strand and wire-rope slings.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 36.

Brings Repeat Orders...

from Contractors

When a big contractor, like the R. B. Tyler Company, Louisville, Kentucky, buys a certain make of motor grader—year after year—it's got to be good.

Operating on a large scale throughout the south, the Tyler Company owns 21 motor graders, a number of which are Adams.

Tyler officials say, "We like Adams machines—like their adaptability, ease of operation, wide range of speeds and over-all economy. This is borne out by the fact that we continue to buy them year after year."

Such experiences prove that Adams Motor Graders are unexcelled for dependability, efficiency and economy. See your local Adams dealer for complete information on these great machines.

A Tyler-owned Adams Grader building a secondary road in Kentucky—one of 10 such jobs the Tyler Company is doing for the Kentucky State Highway Department.

J. D. ADAMS MANUFACTURING COMPANY • INDIANAPOLIS, INDIANA

Make your next motor grader an Adams

Prestressed Concrete; An Experimental Test

New Prestressed-Concrete Girder For the Phila. Walnut Lane Bridge Tested to 11 Times the Design Load

+ OVER 500 engineering experts witnessed experimental tests performed on one of the main-span girders designed for the first prestressed-concrete bridge to be built in the United States. Preliminary tests showed that the girder would withstand twice the working load plus the dead load, without cracking, and that the girder would further withstand a weight, more than 11 times the working load, without destruction.

Loading of the test girder was accomplished by 8 hydraulic jacks, spaced at equal intervals on the top of the beam, simulating a uniform live load. The jack reaction was transferred to 50 tons of iron ingots, set on the ground at each loading point, through overhead girders and vertical adjustable bolts. The total test load, 400 tons live load plus 140 tons dead load, gave the 160-foot girder a simulated uniform live load of 5,000 pounds per linear foot. A 15¼-inch deflection was observed at mid-span under this load. The cracks, which had started to open at a load of 255 tons and widened as the load was increased to 540 tons, closed when this load was removed.

Design

The experimental girder was exactly like those to be used for the main span of the Walnut Lane Bridge, an overpass at Lincoln Drive, Philadelphia, Pa. The bridge was designed by Preload Enterprises, Inc., N. Y., in collaboration with the Engineering Department of the City of Philadelphia, consulting with Professor Gustave Magnel of the University of Ghent, Belgium.

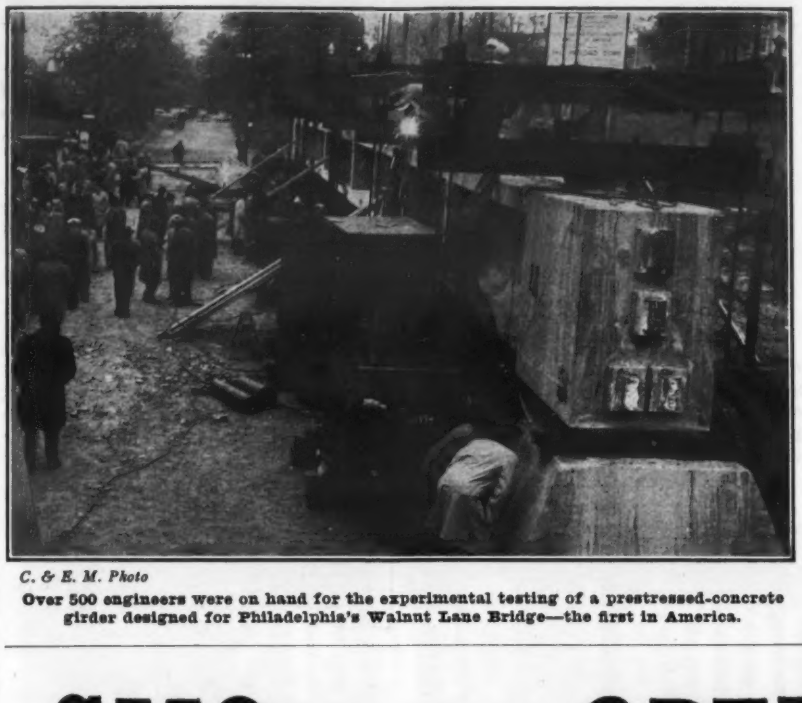
The bridge will consist of a 160-foot main span, flanked by two 74-foot approach spans. The main span will be composed of 13 abutting prestressed-concrete I-section girders. The girders are to be 6 feet 7 inches deep, 51 inches across the top flange, and 30 inches across the bottom flange. Each will have a 7-inch web and will weigh 160 tons.

The principal reinforcement will consist of four "aerated" cables, each containing 64 high-tensile-strength steel wires 0.276 inch in diameter, extending the full length of the girder. Two cables are parallel to the bottom flange; the other two curve upward at the end of the girders. The special wire was designed and fabricated by John A. Roebling's Sons Co., Trenton, N. J.

Construction

The Henry W. Horst Co., Philadelphia, Pa., is the general contractor for the construction of the bridge. The Preload Corp., N. Y., subcontracted the prestressed-concrete superstructure and the experimental testing.

The experimental girder, cast on the site in wooden forms lined with plywood, required 80 cubic yards of concrete. By maintaining a low water-cement ratio, and using side-wall vibration, the contractor obtained a compressive strength in excess of 7,000 psi.



C. & E. M. Photo

Over 500 engineers were on hand for the experimental testing of a prestressed-concrete girder designed for Philadelphia's Walnut Lane Bridge—the first in America.

The reinforcing cables were assembled at the site and inserted in ducts in the girder, formed by special rubber mandrels made for this job by the Quaker Rubber Co. The rubber ducts were especially desirable since the top two were allowed to assume a catenary and had to be withdrawn after the concrete had set. The wires forming the cable were stressed in pairs by hydraulic jacks to approximately 125,000 psi, then anchored in place by sandwich plates and wedges. During stressing, each wire elongated 9 inches. After stressing, the cables were grouted to bond them with the girder to protect the wires from corrosion.

Testing

Electronic strain gages were placed at strategic points on the girder for strain measurements. Dial indicators were used for measuring deflections, and gunners' quadrants for slope meas-

(Concluded on next page)

McKIERNAN-TERRY

Wide-Range Line of **PILE HAMMERS** and **EXTRACTORS**

Now made in complete, standardized line of 10 double-acting hammers, 5 single-acting hammers and 2 double-acting extractors.

Write for free descriptive Bulletins.

Also builders of coal and ore bridges, bulk material unloaders, bridge operating mechanisms, hoists and marine equipment, and specially designed machinery.

McKIERNAN-TERRY CORP.
15 Park Row, New York 7, N. Y.

SMOOOOTH → OPERATION

NO LOSS OF TIME ••• BIGGER PROFITS

FILLS FASTER — FULL PAY LOAD EVERY TIME — DUMPS CLEANER

Switch to a **HENDRIX!**

THREE TYPES FOR EVERY DIGGING PURPOSE

3/8 to 40 Cu. Yds.

Combining rugged construction, larger capacity and perfect balance, HENDRIX DRAGLINE BUCKETS give s-m-o-o-o-o-t-h performance and low maintenance cost. These features mean BIGGER PROFITS to the dragline operators who have already switched to HENDRIX BUCKETS. These buckets make for top-notch operation and have proved their ability to dig more dirt at lower cost. Hendrix Buckets have proved themselves *in the field* . . . their performance, long-life, and low maintenance cost have resulted in bigger profits on every job. *Hendrix Buckets are tough . . . they're made to take it!*

HENDRIX Lightweight DRAGLINE BUCKETS

For descriptive literature ask your dealer or write

HENDRIX MANUFACTURING CO., INC.

MANSFIELD — LOUISIANA

urements.

Preliminary test data indicate:

Feature	Total Load (in Tons)	Deflection (in Inches)	Stress* (in PSI)
Working load	205	1⅛	+1,900 upper flange + 700 lower flange
Twice the working load	240	1⅜	+2,400
First crack	255	2¼	zero +3,000 −1,000
Eleven times working load	540	15¼	
Destruction		25½	+7,000 (approx.)

*Anticipated by calculation

It will be some time before the precise figures can be secured and evaluated. It is also to be noted that the destruction of the girder was not obtained under simulated uniform live load; weights from the two end stations were moved and concentrated at midspan.

Significance

A saving of 30 per cent in bridge cost was effected by using the prestressed design instead of the conventional reinforced construction, according to statements of the Engineering Department of the City of Philadelphia. With prestressed design the depth of the beam is decreased; one-third less concrete is used; and only one-fifth as much steel is required. This is, of course, offset by a slightly higher cost of concrete and a 2 to 2½-times increase in the cost of steel; but a net saving is still realized. Other features of this design include a decreased depth-span ratio, smaller deflections, easier handling by virtue of the decreased weight, high resistance to cracking, and a healing process when loads are removed.

Steel Wrecker Balls

Wrecker balls made of a tough close-grained semi-steel are now available from the Eagle Iron Works, P.O. Box 934, Des Moines, Iowa. These frost balls —also called concrete breakers, skull crackers, and various other names— may be obtained in weights ranging from 2,000 to 4,000 pounds. The cable-fastening ring is recessed within a well at the top of the ball, to protect both ring and cable from damage.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 116.

Valve-Box Locator

The Aqua valve-box locator, adjusted by means of Helmholtz coils to local magnetic conditions, has been announced by the Aqua Survey & Instrument Co., 2518 Leslie Ave., Norwood, Cincinnati 12, Ohio. This unit, the company says, is pre-determined and pretested to any given geographical or climatic condition.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 111.

Tractor Service Tools

A re-issue of the "Caterpillar Service Bulletin" is announced by the Owatonna Tool Co., 348 Cedar St., Owatonna, Minn. This folder, No. CT-49, contains new action pictures of OTC pullers as applied to Caterpillar service jobs involving the removal and installation of bearings, gears, sleeves, bearing outer races, shafts, etc. In addition, several new tools built especially for Caterpillar service are illustrated and described.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 21.

Hose-Coupling Bulletin

A bulletin describing the complete line of LE-HI suction and water-hose couplings has been issued by the Hose Accessories Co., Lehigh and 17th St., Philadelphia 32, Pa. Male hose nipples, brass and malleable suction and water-hose couplings, hose pipe, and adapters are all completely described and illustrated in Bulletin No. 5.

New items shown for the first time include the LE-HI Series 810 brass suction and water-hose couplings which use a hexagon swivel nut in place of the usual pin lug. Series 640 petroleum coupling, another newcomer, is especially designed for handling bulk crude and petroleum, as well as water. The new Series 1700 fire-hydrant reducer couples ¾ and 1-inch hose to fire plugs —a useful item for contractors and builders.

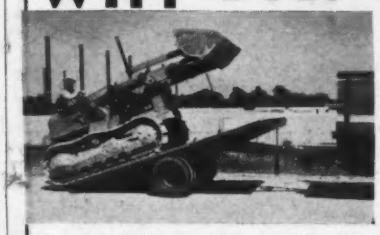
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 25.

PCA Transfers Catton And Opens 26th Office

Miles D. Catton recently took over as Director of Development for the Portland Cement Association, Chicago, Ill. The work of the Development Department, which he is supervising, is directed towards the development of new products and processes and new and improved uses of portland cement and concrete. Mr. Catton used to be Manager of the PCA's Soil-Cement Bureau. He is succeeded in that capacity by J. A. Leadabrand, who has been associated with Soil-Cement Bureau activities since 1936.

In the same month, the PCA opened its 26th district office, in Salt Lake City, Utah, in the David Keith Bldg., 248 S. Main St. Edgar B. Wilson, formerly Structural Field Engineer at the Oklahoma City Office, is in charge.

WHY DOES MILLER MODEL B DO MORE?



Above is an HD5 crawler loading on a Miller Model B Tilt Top. Note frame channels taper from ends to 12" deep at point of load concentration. Miller puts the steel where it's needed.

IMMEDIATE DELIVERY $975.00
Optional equipment below is priced extra.
•TWO SPEED WINCH— allows one man to easily load and unload.
•ELECTRIC BRAKES—give that EXTRA safety feature so often needed.
•HYDRAULIC TILT CONTROL—eliminates platform slap. Is safer & easier to load and unload.

Miller Tilt Tops do MORE and cost less because they're built with steel that DOES more. Why haul NON productive steel?

The Model B all welded taper channel frame is built of pressed steel and engineered to give LOW FIBER stress at areas of highly concentrated loads. The "straight through" axle welded into heavy steel tubing ties the main frame and gives a solid steel support from axle to platform. Dual wheel axle assembly is securely welded with alloy welding rods. Platform is 8' x 14' x 31" high. Dual Budd hubs, wheels, and tires are standard equipment. Model B is on IMMEDIATE DELIVERY for only $975. Get a Tilt Top to do your hauling faster and safer.

RAY MILLER RESEARCH ENGINEERS
Dept. 3129 727 W. Burnham St. Milw. 4, Wis.

A Contractors Building if you ever saw one

As a contractor you probably have pretty definite ideas on the kind of building you need for your own use. Let's see how ARMCO STEELOX Buildings meet these requirements.

Here is a sturdy, dependable building that provides all the advantages you would normally expect in any permanent structure. But the unique construction also makes it ideal for use on temporary sites.

ARMCO STEELOX Buildings are easily and quickly moved. They retain structural strength and weathertightness even when dismantled and re-assembled many times. Obsolescence is never a problem. A STEELOX Building can be quickly extended with standard parts. Loosening a few bolts and re-arranging the panels permit changing doors and windows.

You'll also appreciate how easily and quickly STEELOX Buildings can be erected. The STEELOX Section provides both structural support and finished surface. On the roof it replaces rafters, sheathing and roofing. For sidewalls it eliminates framing and exterior covering.

There is a size and type of Standard ARMCO STEELOX Building for almost every contracting need, and delivery when you need it. Write for complete information. Armco Drainage & Metal Products, Inc., 2355 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

STEELOX Timetable

Actual case history shows how one owner moved a Standard STEELOX Building (12' x 32' x 8') to a new site using only 5 men and a truck.

7:00-10:30 A. M.—*Dismantled building and loaded on truck.*
10:30-11:00 A. M.—*Driving to new site.*
11:00-11:30 A. M.—*Lunch.*
11:30- 7:00 P. M.—*Building completely re-erected and ready for use.*
Only a *total of 55 man-hours required for complete move.*

ARMCO
ARMCO STEELOX BUILDINGS
Permanent or Field Offices • Garages • Drafting Rooms • Warehouses
Shops • Boiler Houses • Watchmen Shelters • Bunk Houses and Others

Oxyacetylene Device For Shape Cutting

A new portable oxyacetylene shape-cutting machine, the Airco No. 3 Monograph, has been announced by the Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

The Monograph is designed to cut steel up to 8 inches thick, in any shape within a 54 by 32-inch area. However, the length of the cutting area can be extended by adding tubular rail extensions. This machine will also handle straight-line, circle, and bevel cutting jobs with a high degree of accuracy. Speeds range from 3 to 30 linear inches per minute.

Standard equipment includes a manual tracing device, torch, tip, tubular rail, hose, straight-edge, radius rod, and carrying case. The entire unit is packed in a carrying case that can be handled by two men and stored in a 7 x 1½-foot space.

Air Reduction offers the opportunity of trying out the Monograph in your shop on your own work.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 64.

Printer Reproduces Color Combinations

A new model has just been added to the line of Whiteprinters offered by Charles Bruning Co., Inc., 4754 W. Montrose Ave., Chicago 41, Ill. Known as the Model 50, it is designed to make reproductions of anything drawn, typed, printed, or written.

Operating at variable speeds up to 24 feet per minute, it delivers prints flat, dry, and stacked in a receiving tray. It requires no plumbing connections or ventilation ducts, according to the manufacturer.

The Model 50 produces BW prints ranging from postcard size to 42 inches wide and any length. Users have their choice of BW sensitized paper, film, and cloth in cut sheets or roll stock. Although most BW prints are made with black lines on white, the Model 50 can produce prints in 20 combinations of colored lines and tinted paper to permit color keying—a practice which helps identify the purpose of a print. Prints are produced directly from the original without intermediate steps.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 22.

Broadside on Snow Plows

A broadside dealing with the full line of Champion snow plows, designed for use with trucks from 1½ to 10-ton capacity, is offered by the Good Roads Machinery Corp., Minerva, Ohio. Specifications and design features for over 30 different models of various types are given. These include reversible blade, tapered blade adjustable, high-speed adjustable one-way, shovel-blade rigid one-way, one-way sidewalk, V-type sidewalk, all-purpose V-type, "drift busting" V-type, and high-speed V-type plows. Each of the series manufactured by the company is illustrated.

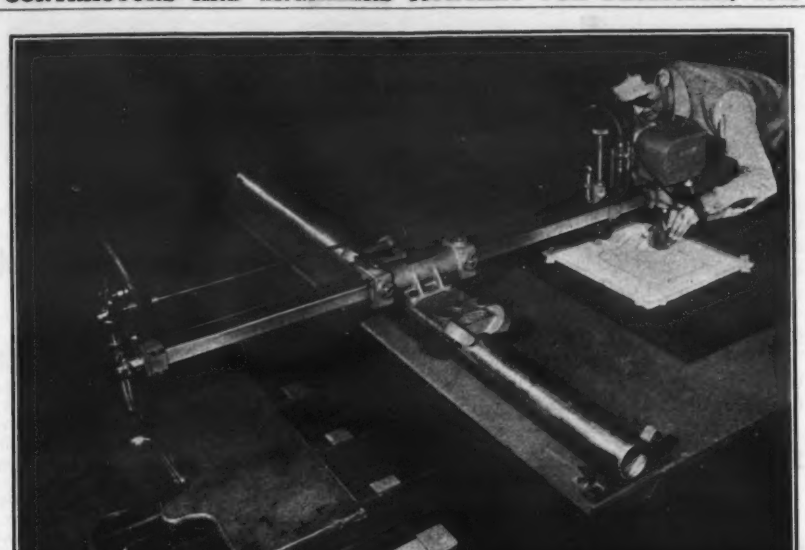
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 31.

Woven-Wire-Cloth Catalog

A 4-page folder describing Wissco-Calwico wire cloth is available from the Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corp., 500 Fifth Ave., New York, N.Y. The oil-tempered precision screens, the catalog explains, are made in sizes from 3/32 inch to 6 inches or larger and are woven from 0.063-inch wire up to a 5/8-inch rod. They are made in flat-weave, flat-mesh, or double-crimp construction, in square, rectangular, or long-shot openings. The company is prepared to furnish screens of steel, galvanized steel, stainless steel, brass, copper, Monel, and Phosphor bronze. Mesh cloth may be obtained from 1-inch to 120-mesh of double-crimp or extra-crimp construction.

The folder explains the plant processing of this cloth, its abrasion and fatigue properties, and the types of weaves and crimp. Specifications and prices for commonly used sizes are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 34.



This is the Airco No. 3 Monograph, an oxyacetylene shape-cutting machine designed to cut steel up to 8 inches thick in any shape within a 54 x 32-inch area.

Portable Power Saws

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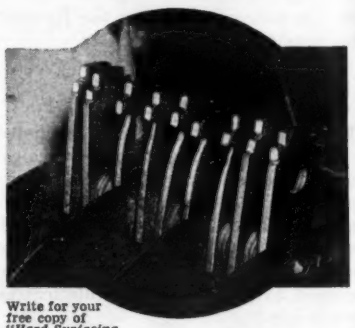

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Job Engineer Collects For Wrongful Discharge

THE PROBLEM: *Defendants, prime contractors on American rehabilitation work in Greece, employed plaintiff as project engineer, reserving the right to discharge him for physical unfitness for the work. Before going to Greece he was found by an Army medical officer to be physically qualified, but on his arrival abroad defendants discharged him on the ground of unfitness. Was he wrongfully discharged and therefore entitled to damages based upon the agreed compensation for the minimum agreed term of his employment, twelve months?*

THE ANSWER: Yes. (Yazujian v. J. Rich Steers, Inc., et al. 89 N. Y. Supp. 2d 551, decided by the New York Supreme Court, Trial Term, New York County.)

Incidentally, the court decided several important points of law generally applicable to the right to discharge employees under employment contracts.

Interpreting the contract in the light of its wording and surrounding circumstances, the court decided: It indicated mutual understanding that plaintiff should be employed for at least twelve months, unless the construction project should be earlier abandoned, or his services should be found to be undesirable or unnecessary, or he should be discharged for cause. Therefore, he was not subject to dismissal on any other ground.

Here are the general rules that the court applied in reaching its conclusions:

If the contract as prepared was capable of being read one way, favoring the employer, or another way, favoring the employee, it should be read the latter way, *because the employer worded the contract.* "If this contract meant what defendants now claim it means, it was their duty to express that meaning in unmistakable language."

In determining the meaning of a certain provision of a contract, separate but related sections of the agreement should be read together. And where there is a choice of interpretations, a court will adopt that which operates fairly, imposing mutuality of obligation, as against an interpretation that will make the contract unfair and one-sided.

By notifying plaintiff that he was discharged for what defendants regarded as "cause", physical unfitness, they virtually admitted that the contract was so worded that plaintiff could not be dismissed on a ground not specified in the agreement.

And, by rejecting his oral notice of claim for damages for wrongful discharge, on the ground that he was rightfully discharged and not on the ground that the notice of claim was not in *writing*, as provided for by the contract, defendants waived plaintiff's failure to give written notice.

The court concluded that plaintiff was entitled to collect $8,500, "the amount that he would have earned under the contract during the minimum period of twelve months" for which he would have been employed, had he not been wrongfully discharged.

Unexpected Rock Haulage Judged Extra-Cost Item

THE PROBLEM: *A reclamation-project contract required that rock used for the protection of a dam should be equivalent in hardness, density, and durability to the best rock for resisting wear and erosion existing in the "vicinity of the work". The contractor reasonably but mistakenly assumed, from an examination of the locality, that suitable rock was available within the area shown on a "Vicinity Map", which formed part of the contract papers. But rock had to be hauled from distant points outside that area and his costs were therefore greatly increased. The contractor requested an adjustment under a clause providing for adjustments if unforeseen or latent conditions should arise. Did the Government officials err in refusing an adjustment?*

THE ANSWER: Yes. (Morrison-Knudsen Co., Inc. v. United States, 84 Fed. Supp 282, decided by the United States Court of Claims.) The court said:

"The contracting officer and, on appeal, the head of the department refused any adjustment, but did not find, as a fact, that unforeseen conditions had not been encountered." They erroneously interpreted the contract to mean that the contractor "had to find suitable rock, at whatever distance from the work, for the bid price." If the rock in the vicinity was suitable, they should have allowed the contractor to use it. "If it was not, an unforeseen condition was encountered . . . or an additional requirement was imposed," within the meaning of clauses of the contract entitling the contractor to an adjustment.

The Court of Claims held it had the right to determine the amount due the contractor because of the extra cost entailed, since the administrative officers of the Government had failed to give fair and adequate attention to the contractor's demand for an adjustment.

Alternative Bids Upheld On Airport Runway Paving

THE PROBLEM: *A municipal charter provision called for award of contracts for public improvements to the "lowest responsible bidder" after competitive bidding. Was this provision violated by calling for bids in the alternative for the construction of an airport runway with 26½-inch-thick asphalt or 18-inch concrete, and in awarding the contract on a $1,472,672 bid for concrete as against a $1,404,627.50 bid for asphalt?*

THE ANSWER: No. (L. & M. Properties Co. v. Burke, 86 N. E. 2d 768, decided by the Ohio Supreme Court.)

The plaintiff, as a taxpayer, sued to enjoin the city of Cleveland from proceeding under the awarded contract and to require acceptance of the lower bid for asphalt construction. Rulings of lower courts in effect dismissed the taxpayer's twin suits. The Supreme Court upheld these rulings and said that a contract award is valid "where the plans and specifications provide in the alternative for different materials and methods of construction, are full, accurate and complete as to each alternative, afford the opportunity as to each alternative, and the award is made to the lowest bidder on an alternative adopted after the opening and consideration of the bids."

The Supreme Court cited statements in legal treatises to support its decision, although it was conceded that there are court decisions in some states where the right to call for alternative bids in specifications has been denied.

In this case, the taxpayer had not questioned the right to call for bids in the alternative, "when two or more materials, highly competitive and equal in all respects, are pitted against each other." But the right

(*Concluded on next page*)

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Avoid Legal Pitfalls

(*Continued from preceding page*)

to make an award to the higher of two bidders on "alternate, equal materials" was challenged. Without discussing the merits of the two classes of materials, five justices of the Supreme Court seemed to support the position that so long as there is opportunity for competitive bidding as to each material involved, it is of no consequence that the lowest and accepted bid for one material may be higher than the lowest bid on the alternative material. The two justices who dissented from the decision took the stand that if the asphalt proposal was "in all respects the equivalent of the concrete proposal," they could not "comprehend how the higher bid for concrete can be that of 'the lowest responsible bidder' ".

Although the two dissenting judges thought that the award of the contract should be set aside, they agreed with the other judges that the unsuccessful bidder was not entitled to a court order requiring that his bid be accepted.

A Cost-Plus Contractor Was Not Owner's Agent

THE PROBLEM: *Does the fact that construction work is undertaken by a contractor on a cost-plus basis imply that he is the agent of the owner for the purchase of materials, and that the owner is therefore liable to the materialman for the price?*

THE ANSWER: No. (Carruth v. Valley Ready-Mix Concrete Co., 221 S. W. 2d 584, decided by the Texas Court of Civil Appeals, Eastland.)

The Texas court cites numerous appellate-court decisions on this point showing that the owner can only be held personally liable on the theory of agency when a construction contract clearly indicates that the contractor is to secure labor or materials on the owner's credit. (Of course, this does not mean that a materialman or subcontractor may not be entitled to a statutory lien. The Texas case deals only with the question of whether a cost-plus contract necessarily implies that the contractor acts for the owner, and not himself, in purchasing materials.)

The decision is in line with what the United States Circuit Court of Appeals, Fourth Circuit, decided in the case of J: B. McCrary Engineering Co. v. White Coal Power Co., 35 Fed. 2d 142: that a cost-plus contractor is not agent of the owner in such sense as to make the owner liable to a third party for damages caused by negligent operation of construction equipment by the contractor's employees.

Surviving Partner's Right

THE PROBLEM: *A partnership's contract to construct mining tunnels and coal chutes for a mining company contemplated personal services of both partners. One of the partners died. Did the surviving partner have a right to make a new contract with the company for the work without being accountable to the estate of the deceased member of the firm for profits under the new contract?*

THE ANSWER: Yes. (George v. Richards, 64 Atl. 2d 811, decided by the Pennsylvania Supreme Court.) The court said:

"A careful reading of the contracts shows that a high degree of skill was required in the planning and supervision of the construction of these tunnels in order to meet the standards of . . . [the coal company]. By the simple expedient of not issuing work orders, the coal company could prevent performance by persons lacking in skill. It is self-evident that, although the contract used language binding the heirs, executors, and assigns of the co-partners, no work orders would be given . . . to any other persons claiming under the contract, except Richards and George [the partners]. The contract envisaged performance by Richards and George and none other. George's death terminated that contract, and rendered it valueless. The surrender of that contract was not consideration for the granting of the new one. The new contract was granted solely because of Richards' personal skill, and he cannot be considered trustee of that for the benefit of George's estate.

"The original contract was a continuing one under which the partnership was to construct all such tunnels and chutes as the coal company should direct, and the partnership existed for the purpose of carrying out that contract."

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Concrete Road Paved To Beach Resort Area

22-Foot Pavement Is Laid On Gravel Base in Rhode Island; Flanked by 9-Foot Bituminous Lanes

By WILLIAM H. QUIRK,
Eastern Editor

THE State of Rhode Island Department of Public Works, Division of Roads and Bridges, has reconstructed a 2.87-mile section of West Shore Road, State Route 117, in the city of Warwick, Kent County. The improvement runs westerly from Shawomet, on the west shore of Narragansett Bay, to Wilde's Corner. Over this stretch an old penetration-macadam highway, 20 to 22 feet wide, has been replaced with a reinforced-concrete pavement, 22 feet wide and 8 inches thick. The work was done by Campanella & Cardi Construction Co. of Hillsgrove, R. I., at a cost of $393,716.

Construction started on May 23 of this year. Concrete paving was done between July 5 and 27, while the remaining items of the contract were completed by fall. The pavement was finished in time to serve most of the heavy summer traffic flowing from Providence, and the densely populated urban areas to the north and west, out to the seashore resorts along the bay.

Urban Road Section

The new road has an urban-type cross section. On either side of the 22-foot concrete pavement is a 9-foot lane surfaced with bituminous concrete. Along the edges of the black-top for the entire length of the job are paralleling rows of 6-inch granite curbing. On the other side of the curb are 6-foot-wide bituminous sidewalks. The entire roadbed has a gravel foundation, 6 to 12 inches deep and 42 feet wide, extending beyond the curb. The 8-inch-thick concrete pavement has a pitch of ⅛ inch to the foot from the center line. The bordering bituminous parking lanes slope to the curb line at the rate of ⅜ inch to the foot.

These 9-foot strips consist of a 6-inch gravel base course that was given a tack coat of T-2 tar applied at the rate of ⅜ gallon to the square yard. On top of that is a 2-inch wearing course of bituminous concrete, known in Rhode Island as a Class F pavement.

The sidewalks are also strongly constructed with a 6-inch gravel foundation on which is laid a 4½-inch gravel base course. The base course was also given a tack coat of tar prior to the laying of a 1½-inch wearing surface of a somewhat finer grade of bituminous concrete, designated as Type I. Beyond the sidewalks the slopes are 2 to 1 for both cut and fill, and are topped with a 6-inch layer of loam.

Grading and Drainage

Along coastal Rhode Island the terrain is flat, making the grading light. The original alignment was satisfactory, so the new road was built closely to the lines of the old except for additional widening on the curves. The early highway was without parking lanes, curbs, and sidewalks, with only narrow shoulders a few feet wide bordering the pavement. The old penetration macadam was torn up and wasted for the most part along the slopes to permit the placing of the gravel foundation course. The excavation was handled by a Lorain 2-yard and a Link-Belt 1½-yard shovel, and a fleet of twelve 6-yard trucks, 8 owned by the contractor and 4 hired.

Drainage was an important factor in the construction of this heavily traveled coastal road. Water was encountered at shallow depths, thus requiring the laying of 12,000 linear feet of concrete pipe from 12 to 24-inch in diameter. The pipe runs back and forth under the road with connections to 200 manholes and catch basins. Pipe was supplied by the Rhode Island Concrete Pipe Co. of Providence.

A gravel pit, only ½ mile off the job, supplied all the foundation material which was handled by the shovels and trucks. A pair of Adams motor graders spread the gravel and shaped the subgrade which was firmly compacted by a Buffalo-Springfield 3-wheel 8 to 10-ton roller.

Concrete Batch Plant

Campanella & Cardi's headquarters at Hillsgrove, R. I., are only 4 miles from the center of the job where a 100-ton aggregate bin and a 300-barrel cement bin, both Blaw-Knox, were set up. Sand came from the contractor's own local pit, while stone for the coarse aggregate was supplied by J. D. Anthony Co. of Seekonk, Mass., just over the state line from Rhode Island. Air-entrained Ironclad cement was shipped by rail from Glens Falls, N. Y., to a siding of the New Haven Railroad at the plant.

A fleet of from 12 to 14 batch trucks, each holding three 8-bag batches, hauled the 1:2:3 proportioned dry batches from the plant to the paver.

The dry weights of a typical 8-bag batch were as follows:

Cement	752 lbs.
Sand	1,550 lbs.
Stone, 1¼ to 2-inch	1,050 lbs.
Stone, ¾ to 1¼-inch	1,200 lbs.
Water (5 gals. per bag)	40 gals

(*Concluded on next page*)

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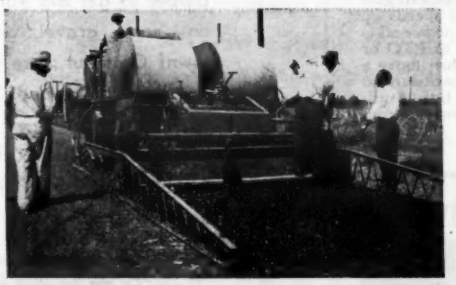

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Write for Bulletin P-46 which gives specifications and complete information.

HETHERINGTON & BERNER INC.
731 Kentucky Ave., Indianapolis 7, Ind.

Concrete Road Paved To Beach Resort Area

(*Continued from preceding page*)

With these proportions and weights the average slump was 2 inches.

Paving Operations

Out on the road about 4,000 linear feet of Blaw-Knox forms were assembled for paving the two 11-foot lanes. The forms were set by hand, and the depth of subgrade was checked with a scratch template. Any irregularities were corrected with shovels. The north lane was paved first, working from east to west, with the Rex 34-E dual-drum paver stationed outside the forms. When the adjoining lane was constructed, also in an east to west direction, the paver worked inside the forms. Local traffic was maintained over the roadbed all through the job.

Expansion joints were located through the slab every 73 feet 6 inches. They consist of a cork filler, ¾ inch thick x 7½ inches deep; that left a ½-inch slot at the top that was later poured with Careylastic sealing compound. The joint material was supported in a Harris assembly. There are no contraction joints in the pavement. The reinforcing included the usual steel-bar mesh 2 inches below the surface of the concrete, with a long U-shaped bar placed under the mat at each expansion joint. The longitudinal joints are the butt type, and have no connecting bars or dowels.

Water for the mix was supplied to the paver from city hydrants that were spotted along the job at frequent intervals. The average length of 1½-inch hose connection from hydrant to paver was 800 feet, with the greatest stretch of hose required being 1,200 feet.

Finishing the Concrete

Batches were dropped between the oiled forms in front of a Blaw-Knox paddle-type spreader which struck off the concrete to the depth required for the steel mesh. After the reinforcing was placed, more concrete was deposited and struck off level with the top of the forms. As the concrete was puddled it was spaded along the sides of the forms. Behind the spreader came a Blaw-Knox finishing machine, followed by the hand-floating and straight-edging.

The finishers dragged a burlap belt along over the surface to remove surplus water and laitance. They edged along the forms with a ¾-inch-radius edging tool, while the center joint was edged with a ¼-inch-radius tool. The protecting caps were removed from the expansion-joint material, and the concrete was covered with Sisalkraft paper for curing. The paper was kept on the slabs for 72 hours.

At the various road intersections, the approaches to the new concrete highway were paved with 8 inches of bituminous macadam, penetration method. This consisted of a 5½-inch course of a crushed-stone base that was given a tack coat of T-2 tar, ⅜ gallon to the square yard, and then covered with a 2½-inch bituminous penetration top course.

The bituminous lanes adjoining the concrete were also given a cover of chip stones, which were applied with a spreader box at the rate of 25 pounds to the square yard.

Quantities and Personnel

The major items in the 2.87-mile paving contract included the following:

Unclassified excavation	44,967 cu. yds.
Gravel foundation	19,076 cu. yds.
Loam	7,073 cu. yds.
Pre-mixed bituminous-concrete surface course, Type F-2	34,423 sq. yds.
Reinforced-concrete pavement, 8-inch	8,080 cu. yds.
Steel reinforcing mesh	38,660 sq. yds.
Granite curb	27,683 lin. ft.
Bituminous-concrete sidewalks, Class I	19,654 sq. yds.

Campanella & Cardi Construction Co. of Hillsgrove, R. I., employed an average force of 75 men during the paving operations under the direction of Nick Abbenante, Superintendent. Guido De Conti was Assistant Superintendent; E. T. Fedeli was General Superintendent.

For the Rhode Island Department of Public Works, William F. Allen was Resident Engineer. The Division of Roads and Bridges is headed by George H. Henderson, Principal Highway Engineer; Lee V. Spencer is Road Construction Engineer.

Agreement Strengthens National Joint Board

Three major changes have been made in the procedures of the National Joint Board for the Settlement of Jurisdictional Disputes in the Building and Construction Industry. Established May 1, 1948, the Board was terminated June 30, 1949, by the Building and Construction Trades Department of the AFL, but was revived on July 27 at the Department's request. Since then it has been disposing of from 30 to 40 routine dispute situations a week. The recent changes in its procedures are designed to improve and strengthen its functions. They became effective October 1 when representatives of industry and labor signed an agreement to that effect.

According to the terms of the agreement: (1) The Joint Board (composed of 4 employer members, 4 labor members, and the impartial chairman, formerly called the "Board of Trustees") is authorized to interpret decisions and agreements of record and established trade practices as they apply to a particular job and dispute in question, and to make a "job decision" assigning the work thereon. But it is not authorized to set a precedent for other jobs or disputes.

(2) It is no longer necessary to carry through to a "national decision" many minor issues that could be settled for the one job only.

(3) In order to strengthen the policy of no work stoppage embodied in the amended agreement, the Board has adopted a rule requiring unions to remain at work even though they protest the manner in which it was assigned by the employers. At the same time, procedures are provided for the unions to protest any assignment to the Board while remaining at work until such assignment is reversed or upheld by the Board.

A national decision may be requested by an international union if it disagrees with a job decision rendered by the Joint Board, or may be requested by the Board at its discretion when it considers an issue of sufficient national importance.

National decisions will be made by "hearing panels" consisting of representatives of the affected unions and of the affected employers' associations, and two disinterested general presidents of international unions selected by the chairman with the approval of the Board. If a unanimous decision cannot be reached by the panel, the decision will be rendered by the impartial chairman and the two disinterested general presidents of international unions.

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Distributor Doings

Proper, Safe Equipment Operation Aided by Dealers' Service

Equipment distributors' service organizations were praised at a meeting of the Construction Section during the National Safety Congress, held in Chicago in October, for their role in the care and maintenance of construction equipment and its safe operation.

One of the program features was a panel discussion on how construction equipment operations can be made safer and easier. One of the points brought out was the importance of a preventive maintenance program in protecting an owner's equipment investment and in keeping machines working profitably and safely. In this connection, one of the panel members spoke of the help being given by those dealers who maintain active and efficient service departments.

An example was cited of a New England distributor who for several years has held a school on preventive maintenance. Manufacturers have cooperated in the project by sending representatives to give training talks. Some 300 contractors, superintendents, equipment men, and highway engineers attended this year's session. A considerable drop in equipment maintenance costs was reported as a result of these training schools in previous years.

Properly maintained equipment is usually safe equipment to operate. This type of dealer assistance in proper equipment care not only is good public relations because it builds customer good will and loyalty but is a contribution to the construction industry. And whatever is good for the industry as a whole is good for everyone connected with the industry.

Exhibits World's Smallest Dragline

It may not star on any construction jobs but it certainly starred at the Houston Construction Industries Exposition. "It" is a scale model of the Link-Belt Speeder K-375 dragline exhibited by Anderson Equipment Co., Houston distributor of Link-Belt Speeder and LeTourneau products. Anderson's Chief Engineer, C. D. Dodgen, built the working model at a cost of approximately $150 as well as 500 hours of work.

The little unit is scaled about 1 inch to 1 foot and weighs about 65 pounds. Its crawlers are 17 inches long and 12 inches wide overall. The top of the cab is 12½ inches high, the top of the gantry is 22 inches high, and the boom is 60 inches long. Four motors and three solenoids power the model, and power transmission is mostly through gearing from war-surplus aircraft instruments. All of the model's movements are to scale and are fully controlled through 17 wires from a remote-control stand. Twelve wires are carried through the center pin by means of a rotating joint with collector rings and brushes, making the machine full-revolving. The bucket is a scale model of McGinnes Bros. 60-cubic-foot bucket and holds 60 cubic inches struck measure or a little less than a quart.

Builder Dodgen has had 27 years of experience in maintaining, operating, and engineering draglines and cranes. But now he has fathered one.

Davey Names Three New Dealers

Three new dealers are handling all items of Davey manufacture, including Air Chief and Auto-Air compressors, portable lighting units, etc. They are: Frost Machinery Co., Ltd., Winnipeg, Canada; Hennessey-Forrestal Machinery Co., St. Louis; and Rosholt Equipment Co., Minneapolis.

Over 2,000 farmers and soil-conservation enthusiasts attended Drott Tractor Co.'s demonstration of land clearing near Tomahawk, Wis., in the course of which several acres of stump-covered timberland were converted to valuable farmland. A Drott stump rake, mounted on an Allis-Chalmers HD-7, piles stumps while an HD-10 with grubber blade prepares to kick out another stump.

Dealer Demonstrates Land Clearing

Some 2,000 farmers and soil-conservation enthusiasts recently watched modern earth-moving equipment convert several acres of stump-covered timberland to valuable farmland 8 miles east of Tomahawk, Wis. Drott Tractor Co., Allis-Chalmers tractor dealer of Milwaukee, Wis., conducted the demonstration which raised the value of the land from $10 or $15 an acre to almost $100 an acre.

A Drott grubber blade mounted on an Allis-Chalmers HD-10 crawler moved the stumps with a straight push or,

(*Concluded on next page*)

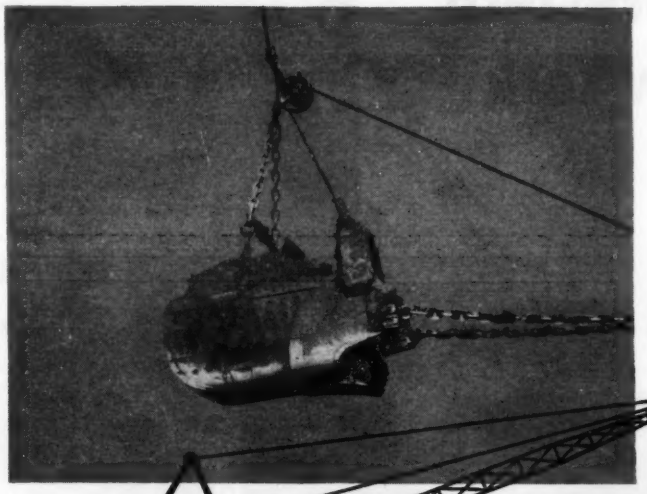
Bituminous DISTRIBUTORS with Original Rosco Features

For over 20 years, we've pioneered features that are now universally accepted . . . Ask about the new V-Jet nozzles, folding safety spraybar and other features that will save you money on the job. *Write for literature.*

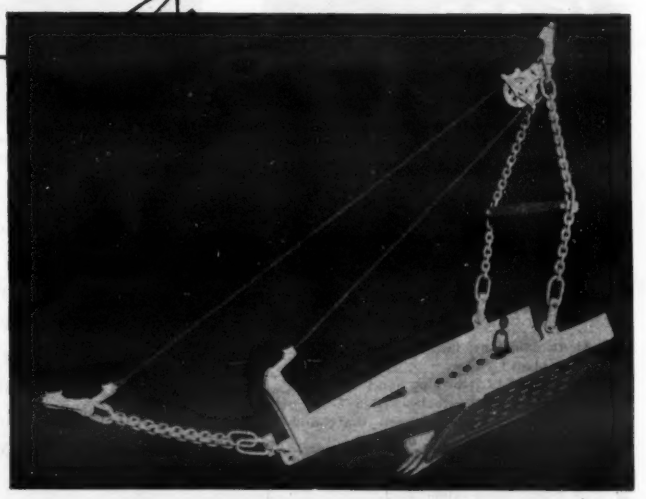
ROSCO MINNEAPOLIS ROAD OIL DISTRIBUTORS STREET FLUSHERS and CLEANERS • MAINTAINERS

Rosco Mfg. Co. ● 3124 Snelling Ave. ● Minneapolis 6, Minn.

YAUN'S DIGGING PAIR FOR BIGGER PROFITS



Yaun's Dragline Buckets—either solid, perforated or basket type—fill faster, dump cleaner and quicker because of their unique design and size-to-weight ratio. Engineered for perfect balance means easier handling for your operator. All buckets available in three weights: light, medium and heavy duty.



Yaun's "Contractor's Ditching Bucket" is another step forward in reducing costs for contractors. Scientifically designed, this bucket digs shallow wide sloping ditches in the sizes needed for the job. Available in sizes from ½ to 1 yard in medium duty weight. Write for full details on this new bucket.

YAUN WELDING AND DRAGLINE BUCKETS, INC.
BATON ROUGE, LOUISIANA

Distributor Doings

(*Continued from preceding page*)

tilted, cut out roots below ground level. Then a Drott land-clearing rake picked up the stumps and shook them to remove excess dirt around the roots so they could be piled up for burning. Later the grubber blade removed any remaining roots and all rocks down to a depth of 12 inches, and the land-clearing rake carried the rocks to one side.

According to E.A. Drott, who became interested over 29 years ago in increasing productive farm acreage, the cost of land clearing by this method ranges from $11 to $45 per acre, depending on the stumps and rocks present.

Represent Riddell in S. E.

Frank Thompson is now working closely with southeastern distributors of Warco graders and Hercules road rollers, as newly appointed District Representative of The W. A. Riddell Corp., Bucyrus, Ohio. His headquarters are in Atlanta, Ga.

N.J. Dealer Opens New Branch

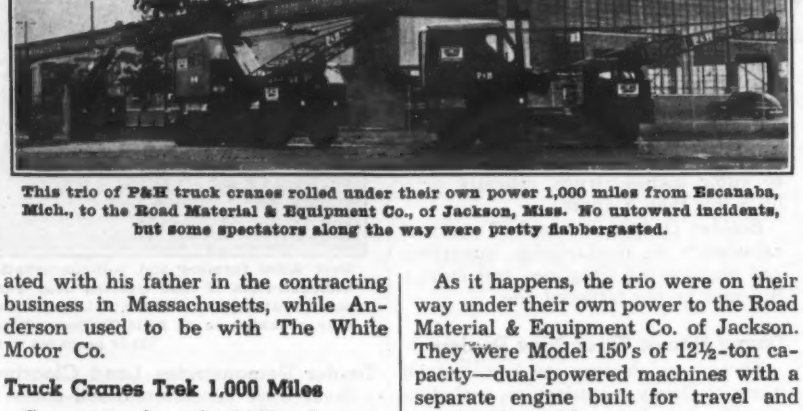
The Jaeger-Lembo Machine Corp. has opened a new shop, service, parts, and sales branch on Route 29 Springfield, N. J. The company handles Jaeger, LeTourneau, Independent Pneumatic Tool, Electric Tamper & Equipment, C. H. & E., and Manitowoc lines in New Jersey. Its Vice President, Frank H. Lembo, is Manager of the new branch. The New York main office and Shop-Service building is located at 127-04 Northern Boulevard, Flushing, L. I.

General Manager for N. C. Dealer

Carolina Tractor & Equipment Co., Caterpillar distributor of Salisbury, N. C., has appointed James N. Cunningham General Manager. Mr. Cunningham was formerly a district representative for the Caterpillar Tractor Co.

Two Salesmen for L. Z. Howell

Frank C. Colletta is now covering metropolitan Chicago and suburbs for L. Z. Howell Co., Inc., construction-equipment dealer. John Anderson was recently assigned the northern Illinois territory. Colletta was formerly associated with his father in the contracting business in Massachusetts, while Anderson used to be with The White Motor Co.



This trio of P&H truck cranes rolled under their own power 1,000 miles from Escanaba, Mich., to the Road Material & Equipment Co., of Jackson, Miss. No untoward incidents, but some spectators along the way were pretty flabbergasted.

Truck Cranes Trek 1,000 Miles

Spectators along the 1,000-mile route from Escanaba, Mich., to Jackson, Miss., blinked at the unusual sight—three P&H truck cranes mingling with the usual highway traffic, and not a construction job in sight.

As it happens, the trio were on their way under their own power to the Road Material & Equipment Co. of Jackson. They were Model 150's of 12½-ton capacity—dual-powered machines with a separate engine built for travel and another for work.

This was the second highway delivery to the well known firm; last spring, one of the first truck cranes to be built in P&H's new Escanaba plant was also driven to Jackson.

Dealerships for Scales Still Open

The Thurman Machine Co. announces that dealerships for its truck and wheelbarrow scales are still available in some sections of the country. Dealers who are interested should address their inquiries to the company at 156 N. Fifth St., Columbus, Ohio.

Cleveland Dealer Changes Address

The George P. Williams Co. of Cleveland, Ohio, has moved from 205 Rockefeller Bldg. to 3135 W. 117th St. Shop and parts-storage space is greater at the new address. Williams represents the Chain Belt Co., Butler Bin Co., Whiteman Mfg. Co., Maginness Power Tool Co., Campbell Equipment Co., and Stow Mfg. Co.

Outlet for Riddell in Indianapolis

Stockberger-Seastrom, Inc., of Indianapolis and Fort Wayne, is now handling the Riddell line of Warco motor graders and Hercules road rollers in all of Indiana except the extreme northwestern counties.

Modernizing Highway in Western New York

With full equipment engaged on the job, contractor gets paving under way in Mt. Morris shopping area.

Fitted with sturdy wire rope, crane swings bucket of concrete over wood form on one of the three new bridges included in the project.

Pointing out highway's path. Left to right: B. R. DeWitt, contractor; Crawford Henderson, resident engineer, and Joseph S. Rectenwald, bridge engineer, both of N. Y. State Highway Dept.; Bernard Fanning, superintendent for Potter DeWitt Corp.

With first course poured, Bethlehem Bar Mat is lowered into place by two men.

Bethlehem Reinforcing Bars in bridge, showing tying prior to pouring.

One of many road projects authorized in recent months by the New York State Highway Department was the modernization of 8.2 miles of Route 36, between Greigsville and Mt. Morris. The new highway is two lanes in width, and its construction, part of which is shown in the accompanying pictures, included the erection of three small bridges. Contractor: Potter DeWitt Corp., Pavilion, N. Y. Reinforcing bars and bar mats were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Tie-Rods • Timber Bridge Hardware • Sheet- and H-Piling

BETHLEHEM STEEL

15,000 V.P.M. in CONCRETE

Flexible shaft speed of only 3,600 r.p.m.

At no extra cost the following Plus-Values!
+ ROLLGEAR vibrator head made of best Swedish steel — RUNS DRY.
+ Snap coupling between shaft and engine — no tools needed.
+ Lubrication of flexible shaft without stripping.
+ V-belt drive eliminated.

These features, PLUS many more exclusive with ROLLGEAR vibrators, patented by VIBRO-PLUS.
WRITE US FOR SPECIFIC INFORMATION AS TO YOUR PARTICULAR VIBRATION PROBLEM!
Free technical booklet.

VIBRO-PLUS PRODUCTS, INC.
54-11 Queens Boulevard
Woodside, Long Island, N. Y.
DEPT. C-12

Mall's lightweight electric tree saw cuts off branches 12 inches in diameter 15 feet above the ground. It will also fell, buck, and limb trees 24 inches in diameter. It weighs 10 pounds.

Electric Tree Saw

A new lightweight electric tree saw has been developed by the Mall Tool Co., 7743 S. Chicago Ave., Chicago 19, Ill. Designed to cut off branches up to 12 inches in diameter, 15 feet above the ground, the saw will also fell, buck, and limb trees up to 24 inches in diameter. When detached from the pole and used as a hand power saw, it will cut heavy piling and timbers. It weighs 10 pounds and can be used on any 110-volt ac or dc line, or operated from a small 750-watt gasoline-engine generator.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 44.

Hydraulic Coupling

A safety breakaway coupling for installation without the use of tools, chains, or brackets is now manufactured by the Hudlen Hydraulic Co., 1138 Chico Ave., El Monte, Calif. As a special feature it can be reconnected by hand against pressures up to 1,500 pounds.

The Hudlen hydraulic coupling affords a full flow in ⅜, ½, ¾, and 1-inch sizes. It is designed to seal hose ends automatically before the connection breaks.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 54.

Tractor-Shovel Catalog

Catalogs describing five models of Payloader tractor shovels have been prepared by The Frank G. Hough Co., 801-F Sunnyside Ave., Libertyville, Ill. The models range from the HA, with a 10½-cubic-foot bucket and 1,000-pound lifting capacity, to the Payloader Buggy, with a capacity of 2 cubic yards or 5,000 pounds.

The catalogs give complete descriptions and specifications of all standard and accessory equipment. They point out that the unique boom design of the Payloader automatically tips the bucket backwards 40 degrees during the first few feet of lift to prevent spillage; and that a simple low-pressure hydraulic-control system, with double-acting twin rams, raises and lowers the bucket. Fully dimensioned drawings, on-the-job photographs, and detailed illustrations of construction features are given for all models.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 129.

Fastening Specialties

A new 28-page manual, with full descriptive and engineering data on a broad range of Southco blind rivets, anchor nuts, panel fasteners, door-retaining springs, and various newly developed fasteners, has been announced by the South Chester Corp., Finance Bldg., Philadelphia 2, Pa. These items are designed for fastening metals and woods in a variety of combinations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 119.

General-Purpose Sprayers

A bulletin on a line of portable general-purpose light-duty sprayers can be secured from the Hardie Mfg. Co. of Hudson, Mich. Available in a wide range of models, the Hardie No. 99 high-pressure sprayers are all equipped with pumps designed to deliver 4 gpm at 300 psi. They are powered by 1-hp gasoline engines and have 50-gallon steel tanks with propeller-type agitators. The folder gives descriptions, specifications, and illustrations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 101.

Check these advantages!

Compare the Features of the High Discharge Transport Truck Mixer:

- VISIBLE MIXING
- FAST OPEN TOP CHARGING
- FULL VIEW INSPECTION
- ALL STEEL CONSTRUCTION
- SUPERIOR MIXING ASSURES QUALITY CONCRETE
- ALL BEARINGS FULLY PROTECTED FOR LOW MAINTENANCE

Write for full details on this durable, efficient mixer.

CONCRETE TRANSPORT MIXER CO., INC.

4984 Fyler Ave., St. Louis 9, Missouri

The New "201" CRUSHING and SCREENING PLANT

The shovel-loading hopper is fitted with inclined grizzly, and mechanical feeder. All principal units are shaft and V-belt driven. Motion the fully-enclosed brakes.

You'll Like Its—

HIGH OUTPUT. With its jaw and roll crushers, the "201" is capable of producing especially large amounts of ¾" and smaller product.

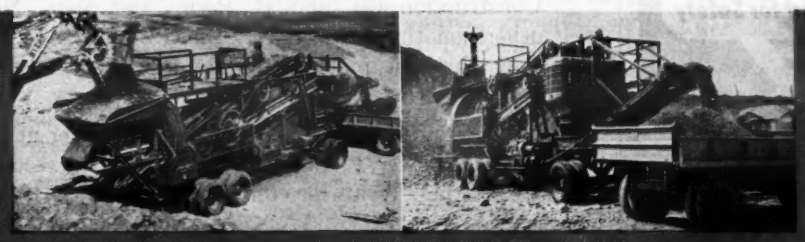
CHOICE OF FEED. The "201" may be had with either shovel-loading hopper, or swivel drive for separate feed conveyor.

READY PORTABILITY. The "201" is of a size and weight that can be transported over most highways without a special permit.

ENCLOSED BRAKES. Hydraulic brakes, mounted on the *outside* of the wheels, are dustproof and watertight.

TOP-NOTCH ENGINEERING. All bearings of anti-friction type; all principal units, shaft and V-belt driven; all moving parts well protected by guards.

The full-length platform provides a clear view of the screen. The clutches can be operated from the platform, or from the ground.



When fitted with shovel-loading hopper, the "201" plant is completely portable. No parts need be removed for transporting.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859

Warehouse Concreting Speeded by Ingenuity

Special Form Supports Devised for Floor-Slab Pours; Inclined Ramp And Buggies Used for Pouring

✦ SPECIAL jack forms, efficient concrete pouring, and a superintendent's ingenuity are speeding construction of a six-story reinforced-concrete and brick warehouse for Kimberly-Clark Corp. at Neenah, Wis. Begun in May, the ultra-modern structure was nearly 50 per cent completed in September. F. H. McGraw & Co., engineers and constructors of New York, Hartford, and Chicago, hopes to deliver the building to the client by Christmas.

The warehouse is 220 x 147 feet and will contain 262,500 square feet. When completed it will be used to store creped wadding and raw materials used by Kimberly-Clark in its manufacturing operations. Since the building will be exclusively for storage, the brick walls will have no windows—air circulation will be provided artificially. The cost of the project is in the neighborhood of $1,000,000.

The entire building rests on spread footings, except for one corner where, because of soil conditions, 217 wooden piles were driven. The piles were sawed off evenly and covered with a concrete cap. Concrete columns support the floor slab. They are 30 inches in diameter and have drop heads, and were poured in Bethlehem circular steel forms.

Form Supports and Ramp

As the ceiling heights of the building vary from 12 to 14 feet, McGraw engineers were faced with a costly requirement of making many vertical falsework supports of different lengths for the floor slab forms. To reduce this expense, they devised variable-length supports which were set on 3,000-pound jacks so that they could be adjusted to the required ceiling height. The same set of forms and falsework supports was used throughout the entire structure. Simple trusses carried the forms for the slabs.

To speed pouring of the first-floor slab, Superintendent Ray Nunez designed an inclined ramp which provided direct access to the street. The ramp, 20 feet wide and 10 feet deep, and inclined at an angle of 30 degrees, was placed on the street side so the ready-mix trucks could drive up to the foot of it. The concrete could then be picked up in 10-cubic-foot Bell Prime Movers, carried up the ramp at high speed, and poured. A rate of 40 cubic yards per hour was reached using this method. At times, pouring was at the rate of 51 cubic yards per hour.

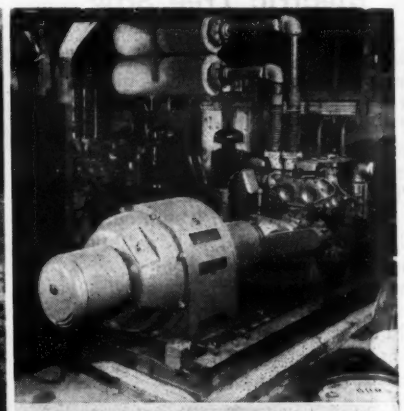
Train Shed

So that materials to be stored in the warehouse can be loaded and unloaded in all kinds of weather, plans called for an enclosed train shed 33 feet wide along the entire south wall of the warehouse. The outer wall of this shed acts as a retaining wall to take the laterial thrust of the heavy train loads on the fill inside the shed. Surface contours permitted pouring of the train-shed wall entirely above ground. About 8 feet of backfill will be placed around the train-shed area.

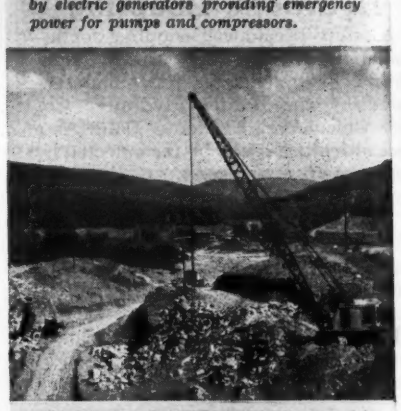
(Concluded on next page)

F. H. McGraw & Co. builds a warehouse for Kimberly-Clark Corp. at Neenah, Wis. Reinforcing bars are in place for the concrete columns which support the first-floor slab. In the background are steel forms for a train-shed wall.

The 200-ft. rolled earth Downsville Dam will stretch across a half-mile-wide valley of the east branch of the Delaware River. View shows core wall under construction by Walsh-Perini, who also have the contract for 25-mile diversion tunnel.



Two GM Diesel Twins drive 200 kw. stand-by electric generators providing emergency power for pumps and compressors.



GM Diesel replaced the original power in this crane, shown placing rock on inlet channel wall.

Doing Every Kind of Job at Downsville Dam

A fleet of GM Diesel-powered Euclids is used at Downsville by Walsh-Perini, and by White Oak Excavators, Inc. on highway relocation.

On big construction projects everywhere, you'll find an ever-growing number of General Motors Diesels taking over more and more of the tough jobs.

Shown here are some of the many different jobs these rugged 2-cycle Diesels are doing on Downsville Dam and the $44 million tunnel to carry water toward New York City. Contractors Walsh Construction Co. and B. Perini and Sons, New York, and others on this project, rely on GM Series 71 Diesels because they start fast, pinch pennies on fuel and stay on their feet with little attention.

If you are interested in dependable power at the lowest cost per horsepower, it will pay you to check the records GM Diesels are making. Write for complete information.

DETROIT DIESEL ENGINE DIVISION

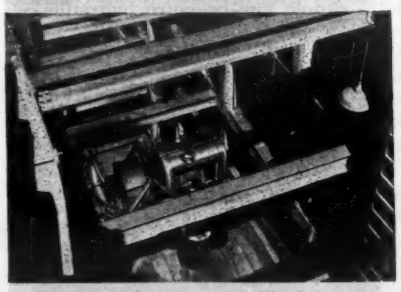
SINGLE ENGINES...Up to 200 H.P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS...Up to 800 H.P.

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

GM Series 71 2- and 3-cylinder Diesel engines power screens and conveyors on gravel-washing plant of sub-contractor, Cooney Bros.



One of a battery of 13 GM Diesel 3- and 4-cylinder engines used by Walsh-Perini to power water pumps.

For Construction Maintenance and Repairs

PUNCH-LOK

HOSE CLAMPS AND FITTINGS

LOOK—It's locked for Safety

Today's Best Bet For Leakproof Hose Connections

Write for Catalog and Air Leak Cost Chart

PUNCH-LOK COMPANY

Dept. A, 321 N. Justine St., Chicago 7, Ill.

On the Neenah warehouse job, a ready-mix truck dumps a load of concrete in a bucket for a wall pour (left). At center, Concrete Foreman D. J. Monacchio is about to crank up a Bell Prime Mover used to speed concrete pouring. At right, McGraw's Job Engineer Elmer Lyle sights a transit while Monacchio gives an assist.

The warehouse was designed by the engineering staff of Kimberly-Clark Corp. Donald W. Neville, Vice President in charge of McGraw's Chicago office, is in charge of the construction project.

Corrugated Culverts, Galvanized or Coated

Catalogs describing corrugated culverts, galvanized or bituminous-coated, are available from the Wheeling Corrugating Co. of Wheeling, W. Va. Both galvanized sections and bituminous-coated sections come in diameters from 8 to 84 inches. These culverts can be made in any length required, in multiples of 2 feet. Pure iron or copper-steel material may be secured.

The folders point out that all Wheeling culverts are pure-zinc-coated to the established standard of 2 ounces per square foot. Three types of coating are available for the bituminous-coated corrugated culvert pipes: full coated without pavement, full coated with paved invert, and half coated with paved invert. The folders describe all standard sections and fittings and give data on diameters and weights for all types of pipe offered. They also note that perforated corrugated pipe is available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 126.

Literature on Lumber

"Western Red Cedar Lumber" and "Sitka Spruce Lumber", second and third in a series of pamphlets on species of wood, are now available from the West Coast Lumberman's Association, 1410 S. W. Morrison St., Portland 5, Oreg. Printed in two colors, with numerous illustrations, the 8-page folders briefly describe the properties and uses of lumber manufactured from the two species by west-coast sawmills.

This literature may be obtained from the Association, or by using the Request Card at page 16. Circle No. 132.

Lettering Instrument

A folder describing the new Varigraph lettering instrument and templets is available from The Varigraph Co., Inc., Box 690, Madison 1, Wis. The Varigraph, the catalog explains, is a precision instrument with which more than 500 variations of any alphabet can be produced using only one templet. By setting two dials, the reproduction of any templet alphabet is reduced, condensed, or extended in the desired ratio.

The folder illustrates the Varigraph, its operation, and some of the variations possible from one templet. Specifications of the device are also included.

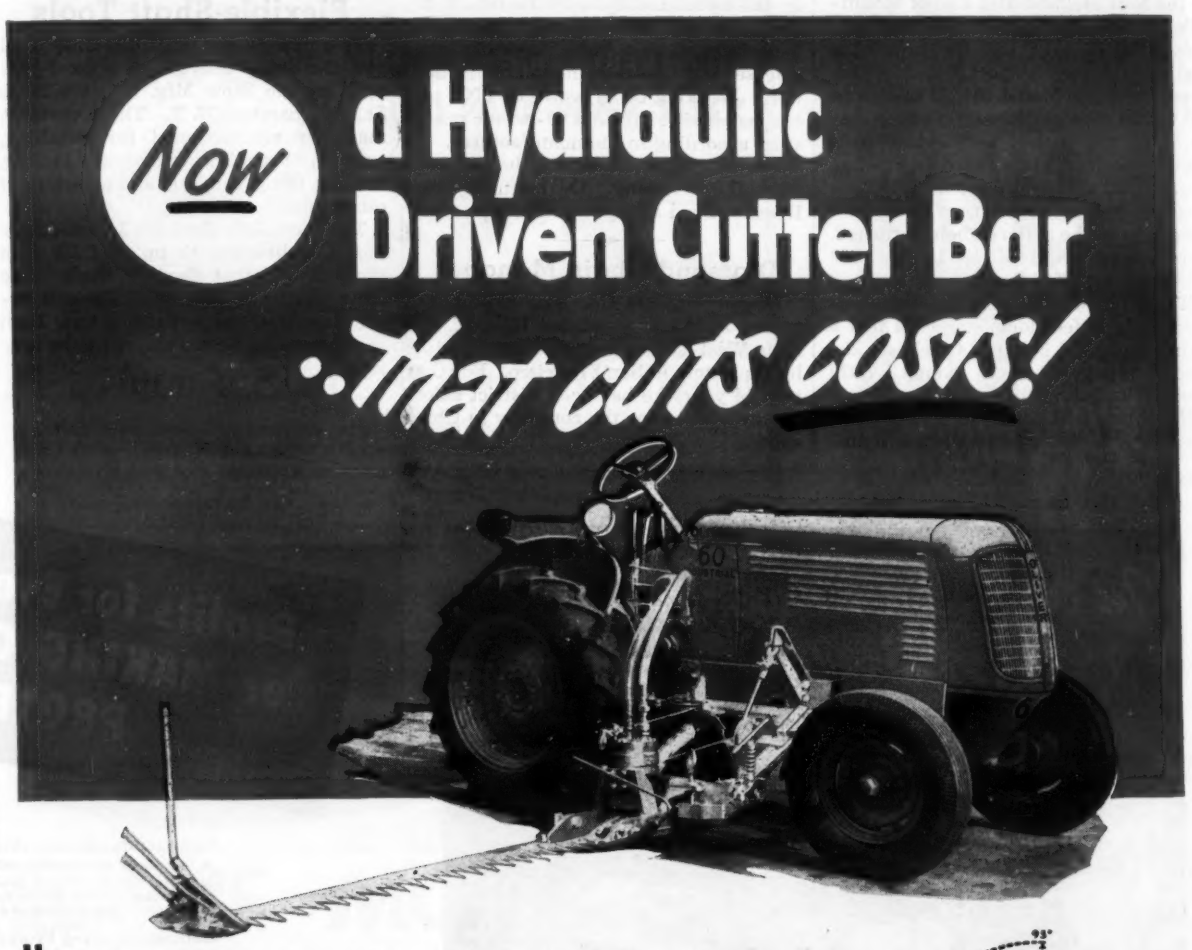
A second folder is devoted to style charts of all of the Varigraph lettering templets that are available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 11.

Reinforced Concrete, Prestressed and Precast

Prestressing and precasting reinforced concrete for use in highway bridges and structures is the subject of an annotated and abstracted bibliography, No. 7, issued by the Highway Research Board. This bibliography and collection of articles, abstracts, and reviewer's comments was prepared as a progress report on a comprehensive review of recent literature. Robert M. Barton, Assistant Bridge Engineer, California Division of Highways, was the compiler.

Copies are available direct from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. Price: 75 cents.

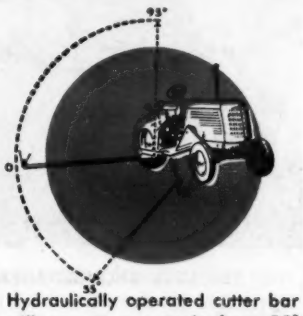


Here's the really new mowing unit that cuts mowing costs on anything from thick matted grass to moderate brush. Oliver Model "60" and "77" Industrial Wheel Tractors and Davco Hydro-Mowers assure lowest cost per mile of mowing. Here's why!

The hydraulic motor drive of the knife makes possible smooth operation. Hydraulic safety mechanism practically eliminates damage to the knife that might be caused by refuse in the mowing path.

This efficient, new unit will mow at any angle from 55° below to 95° above the horizontal. Constant speed hydraulic power enables the mower to cut right up to an obstruction. Finger-tip control that instantly raises the cutter bar hydraulically to clear obstructions...full visibility . . . and lack of vibration effectively reduce operator fatigue . . . permit more work to be done per day.

Oliver Industrial Wheel Tractors and Davco Hydro-Mowers are the ideal units for highways, railroad right-of-ways, parks, airports, and plant grounds. Your Oliver Industrial Distributor will be happy to give you all the facts on lower mowing costs or, write The Oliver Corporation, Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio.

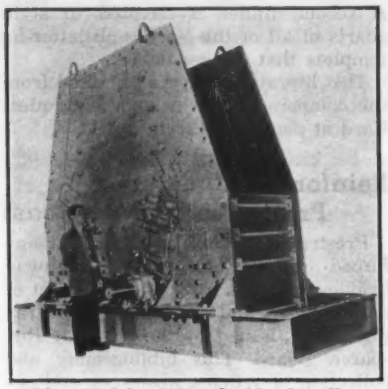


Hydraulically operated cutter bar will mow at any angle from 55° below to 95° above the horizontal. The shoe can be raised 18 inches above the ground level.

THE OLIVER CORPORATION

A Complete Line of Crawler and Industrial Wheel Tractors

"THE SIGN OF EXTRA SERVICE"



This Model 4040 double-impeller-breaker is the fifth model produced by New Holland Mfg. Co. to reduce stone through impact in suspension. The Model 4040 can handle material passing a 40-inch square opening. Capacity is 150 to 250 tons per hour.

New Double-Impeller Breaker Announced

Production of the Model 4040 double-impeller breaker has been announced by the New Holland Mfg. Co., of Mountville, Pa. It is the fifth model the company has brought out for producing aggregate through impact in suspension. Capacity of the Model 4040 is said to be 150 to 250 tons per hour, breaking material to 2½ inches and minus in a closed circuit. This is based on average Pennsylvania blue limestone and will vary depending on the type and characteristics of the material being crushed. Horsepower required is 150 to 200 (electric) or 220 (diesel).

Weighing 65,000 pounds, the new breaker is 17 feet long, stands 11 feet 6 inches high, and is 8 feet 4 inches wide. Twin impellers each weigh 7,929 pounds, including three 643-pound impeller bars with each impeller. The breaker is designed to handle any material passing a 40-inch square opening. Liner plates of the breaking chamber are made of 1-inch and 1½-inch manganese and abrasion-resistant steel. Outer plates are 1½-inch mild steel. The breaker is V-belt-driven with an individual drive to each impeller. Shafts are turned from high-grade alloy steel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 57.

Air-Operated Pump

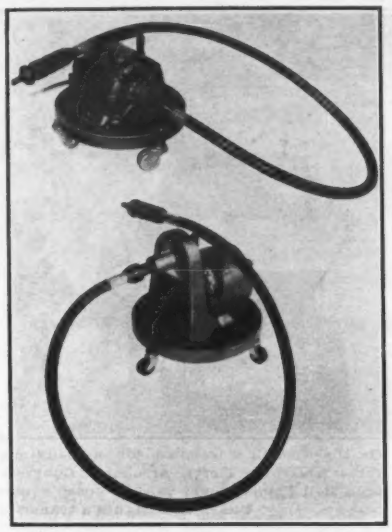
A continuous-acting air-operated pump has been introduced by Lyon-Raymond Corp., 25459 Madison St., Greene, N. Y. In operation, the new air motor is so arranged that it runs by holding open the valve which controls the air supply. A reciprocating valve alternately diverts air pressure from one side of the air piston to the other. A relatively large air piston is directly connected to a small hydraulic piston which pumps oil under high pressure.

The pump is equipped with a built-in release valve to permit pressurized oil in the hydraulic cylinder to return to the reservoir by gravity. A single 3-position 4-way valve operates the release and controls the pumping action. Working oil pressure of 1,000 psi can be obtained from a 90-psi air pressure, according to the manufacturer.

Further information may be secured from the company. Or by using the Request Card at page 16. Circle No. 134.

Diamond Chain Manager

Diamond Chain Co., Inc., of Indianapolis, Ind., has appointed Howard W. King West Coast District Manager with headquarters in San Francisco. For the past 14 years he has been district sales representative for the company in Chicago.



Two new flexible-shaft power units—the Jiffy Tool, at top, and the Speed Jiffy below—for polishing, routing, grinding, buffing, sanding, and operations of a similar nature.

Flexible-Shaft Tools

Two new power units, the Jiffy Tool and the Speed Jiffy, have been developed by the Stow Mfg. Co., 400 State St., Binghamton, N. Y. These portable machines are designed for polishing, routing, brushing, grinding, buffing, drilling, filing, sanding, and a variety of other jobs.

The Stow Jiffy Tool is a 3-caster floor model, delivering ¼ hp at 1,750 rpm through a 5-foot flexible shaft. The motor unit operates on a 110-volt 60-cycle single-phase ac lighting line. Both ⅓ and ½-hp units may also be obtained.

For more complex operations, Stow offers the Speed Jiffy which has three speed variations—1,000, 1,750, and 3,000 rpm. These velocities are obtained by altering the plug-in position of the flexible drive shaft. The Speed Jiffy features an automatic tensioning belt. No adjustments in the belt are necessary, according to the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 60.

Earth-Movers on the Job

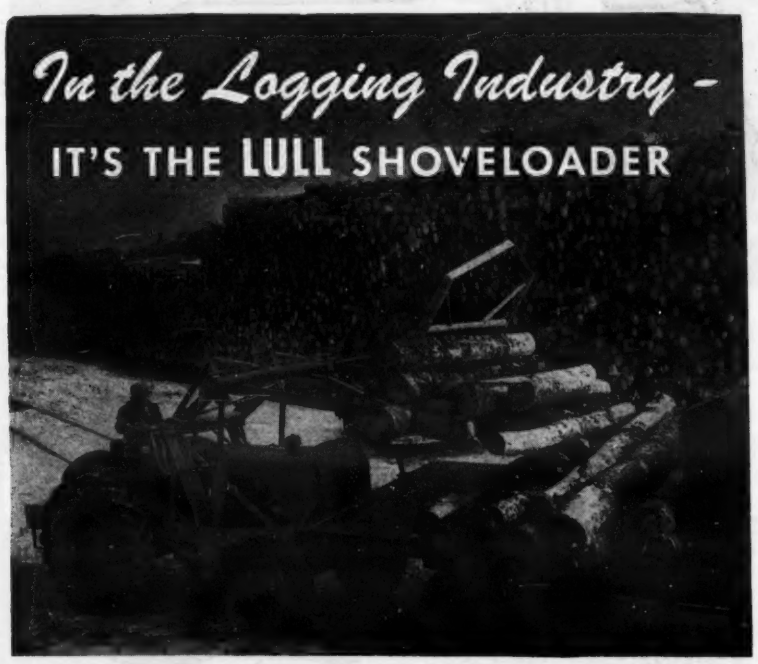
An action-photo review of International crawler and wheel tractors in a variety of dirt-moving operations is presented in an attractive 2-color pamphlet issued by International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. Models ranging from the 19-ton TD-24 of 140 drawbar horsepower to the 44-drawbar-horsepower ID-19 are shown on typical jobs with matched mounted or drawn equipment. Brief captions give work details and owner reports of tractor performance.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 133.

Diesel Locomotive Crane

Catalog No. 600 L-7, on the new American Model 410 10-ton-capacity diesel locomotive crane, has been prepared by the American Hoist & Derrick Co., St. Paul 1, Minn. Full specifications and design features of this unit are given. Photographs of the machinery deck are also included.

This literature may be obtained from the company, or by using the Request Card on page 16. Circle No. 39.



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SHOVELOADERS are built in 3 sizes — all are equipped with *LIFETIME* pistons and rings — every model designed for cab installation except extra-high lift SHOVELOADERS.

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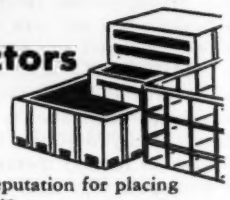
contractors



Contractors cut costs through . . .
- Increased workability and placeability
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Block and pipe plants cut costs through . . .
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- Increased material yield

Provides an opportunity to increase sales by establishing a reputation for selling higher quality and better appearing blocks and pipe.

ready-mix, pre-mix, etc.

Manufacturers of concrete, such as Ready-Mix and Pre-Mix, cut costs through . . .
- Saving in material
- Reduced segregation
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Plant-Mix Surface Covers New Highway

High-Type Bituminous Pavement Goes In Fast As New Equipment Works At Top Capacity

✦ MOVING at a fast pace, men and equipment of Peter Kiewit Sons Co. have warmed up the highway literally and figuratively, near Wheatland, in eastern Wyoming. For a contract price of $175,000 the Kiewit organization topped out with hot-mix a new 12.29-mile relocation on US-87, south of town. The work was done with Federal-Aid financing under a Wyoming Highway Department contract.

This work finishes a new grading project which was started a year ago by S. Birch & Sons of Great Falls, Mont. Included in the Kiewit job were crushed gravel base course materials, plant-mix asphaltic concrete surfacing, a base course prime, and a plant-mix seal-armor coat.

Sparked by equipment which had just enough work to break it in properly, the paving moved ahead at the rate of approximately 8,500 linear feet of 12-foot lane per day. The 24-foot pavement was placed in two lanes. The asphalt plant was new; the laydown equipment was practically so; everything but the men in charge of the equipment. They were old heads, which probably accounted in part for the productive showing which was made.

Will Correct Dangerous Situation

The new relocation shortens the existing highway between Wheatland and Cheyenne by 3 miles. It eliminates dangerous curves, straightens the alignment and improves sight distances which were prevalent on the old 18-foot highway, built more than 20 years ago. The new road will now be much more free of snow. It will not drift so badly on the raised roadbed and flat backslopes.

The new highway is 40 feet wide. That includes 24 feet of pavement with 8-foot shoulders on each side. The prime coat under the pavement is 26 feet wide, thus extending the oil out 12 inches on each side of the asphaltic concrete. The shoulders were constructed out of the same 1-inch maximum size select material from which the subbase was built.

The new highway goes up several long grades. In these places, where the engineers could not maintain their designed sight distances, the highway was widened by the addition of an extra lane. This will be marked by a painting crew some time in the near future so ascending traffic will have two lanes. That lets fast automobiles pass with safety the slow-moving trucks and buses which use the highway.

The silty clay subgrade was put down by S. Birch & Sons to an average standard density of 95 per cent. It was covered with 6 inches of selected material, generally pit run gravel, which was rolled and graded off to finish lines.

The contractor has now followed this work by producing over 53,000 tons of select crushed gravel base course, 1-inch maximum in size, and processing it in place to make a durable flexible base under the asphaltic concrete paving. The sub-base was placed in a tapered pattern, from 4 to 8 inches thick at the outside, and from 2 to 6½ inches thick at the roadway centerline.

Portable Crusher Makes Base

A Cedarapids Master Tandem crushing plant produced the sub-base rock; mineral aggregate for the hot-mix; and cover chips for the seal coat. It also produced mineral filler for two short stub secondary connections in the immediate vicinity; one a road-mix project, the other an inverted penetration bituminous treatment.

C. & E. M. Photo

An intruder on Wyoming rangeland, a Pioneer Continuflo asphalt plant, property of Peter Kiewit Sons Co., produces hot-mix for a job on U. S. 87.

The rock pit for this project was only slightly off the center point. It was situated in one of the best graded pits in which the plant had ever worked. The big Master Tandem, Cedarapids' largest portable plant, had to crush only about 15 per cent of the rock. The rest was a sizing job, and there were few rejects.

With this natural arrangement, the plant operated beyond its top rated capacity.

The rock went from the plant to the highway, where it was road-mixed with water by Caterpillar No. 12 motor patrols, before being laid. After the

(*Continued on next page*)

A ROGERS 'Tagalong' Trailer AND YOUR DUMP TRUCK

...form a PROFIT-PRODUCING TEAM

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One man can do all jobs. Load and unload trailer, connect and disconnect it; drive truck and operate equipment carried.

Ideal for light and medium shovels, cranes, bulldozers, etc.

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Showing cable around sheave and dump body about to be raised to engage towing tongue.

Body elevated. Tightened cable has raised drawbar and engaged towing tongue. Safety coupling pin is inserted. Trailer is ready to roll when body is lowered.

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C. & E. M. Photos

A Hough power broom (left) cleans the primed surface of U. S. 87, near Wheatland, Wyo. Then a Barber-Greene Finisher (above) lays hot-mix. A Kiewit workman at right removes large particles from the center ridge to give a smooth, invisible longitudinal joint.

Plant-Mix Surface Covers New Highway

(Continued from preceding page)

lifts were bladed down, several Bros pneumatic rollers pulled by International MD rubber-tired tractors compacted the rock to good density.

A bit of maintenance on this subbase was found necessary, when some of the swampy soft places gave a little trouble. But they were removed, and in some cases backfilled with new crushed rock. The whole job was primed ahead of hot-mix paving, with the exception of a few short stretches which needed a little more maintenance and rolling prior to paving. An 1,800-gallon Etnyre asphalt distributor primed the sub-base, using 4/10ths gallon of MC-0 to the square yard. This prime coat penetrated ½-inch deep. Since no traffic except hot-mix trucks was permitted on the new highway, it held up in excellent shape.

A Hough power broom, towed by a pickup truck, swept the primed surface just ahead of the hot-mix laydown. This operation got rid of any loose rocks or dust which might have gotten on the prime coat from the time it was laid down until the paver arrived.

A New Hot Plant

From far and near, people have come to look at this new hot plant, which was set up at the rock pit about halfway through the project. There were ordinary laymen from Wheatland and the surrounding country, engineers from the highway department and the CAA, and a few contractors who wanted to see for themselves what the plant would produce.

The asphalt plant was a new Pioneer Continuflo. It had done only 33 miles of highway work so far: 18½ miles last year mostly between Jordan and Grass Range, Mont., and 14½ miles this year near Casper. Even though the machine was set up in the middle of remote rangeland, its dust collector was operating and the plant was neat, clean and orderly.

The aggregate stockpile, containing an average of 5 per cent moisture, was left neatly shaped behind the rock crusher by its attending bulldozer. The feeder trap and conveyor belt were installed on an edge of this pile. A D6 Caterpillar-mounted bulldozer was able to keep the plant supplied with aggregate.

There three horizontal asphalt storage tanks, with a total capacity of 32,000 gallons, were set up. These tanks were heated by steam coils. Steam was furnished by a Cleaver-Brooks steam generator, part of the plant. The No. 3 fuel which the Cleaver-Brooks boiler used was stored in a 5,000-gallon horizontal fuel tank. Heavier, cheaper fuel was used on the drier, so the No. 5 grade fuel for its burner was stored in an 8,000-gallon tank. Asphalt and fuel tanks were arranged neatly on the south side of the Pioneer plant.

In addition to its tank-heating function, the automatic fired generator furnished steam to atomize drier burner fuel, and it operated the discharge gate at the pugmill. The Continuflo plant had four auxiliary engines: a 65-hp General Motors diesel which drove the drier; a 130-hp General Motors diesel on the pugmill; a 43-hp General Motors

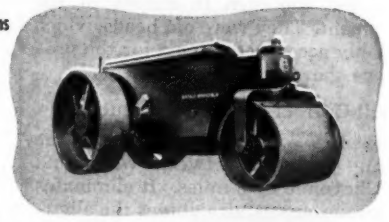
(Continued on next page)

Buffalo Springfield Rollers

FOR A BETTER JOB AT LOWER COST!

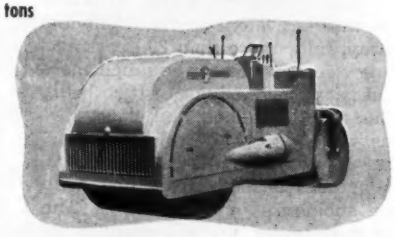
3-WHEEL Sizes: 5 to 14 tons

Buffalo-Springfield 3-Wheel rollers with all welded box frames and heavy steel side plating have the extra strength for long hours of continuous low cost operation.



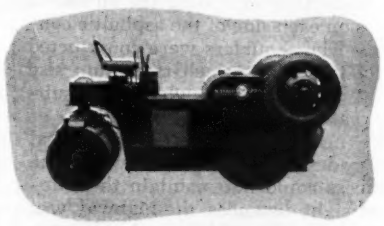
TANDEM Sizes: 1½ to 21 tons

All Buffalo-Springfield Tandems have the final drive on the side opposite the operator giving maximum operator vision. Bevel gear final drive reduces roller overhang. Result: Closer rolling, with fewer passes and lower job costs.



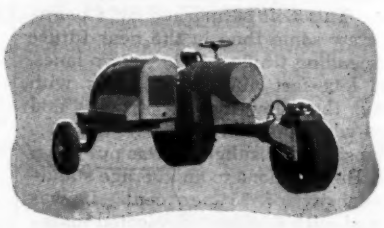
PORTABLE

A simple towing attachment and easily installed road wheels give this roller maximum portability. Quickly towed from job to job, the KT7, with 3 to 4 ton capacity, will handle all your small jobs economically. Ideal for "patch work."



TRENCH

Specially designed for rolling trenches and equipped with hydraulic leveling device, the Buffalo-Springfield Trench Roller cuts rolling time on widening jobs.



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diesel on the dust collector fan; and a U-4 International on the screens and hot elevator. There was also a 1½-kw light plant to furnish a few lights around the place.

The "Hot Way" Through!

The route of aggregate through the plant was indeed the hot way through. After the D6 shoved the aggregate into a Pioneer trap containing a 30-inch mechanical feeder, the rock passed into the drier over 50 feet of 24-inch belt conveyor. The big 24-foot, 90-inch-diameter drier, friction driven by two trunnions, agitated and heated the rock. A long, blazing hot flame from the Ray air-atomizing, steam-turbine-driven burner at the lower end roared through the big cylinder at a temperature of 2,200 degrees F. This burner and the drier were so efficient that when the western editor of this magazine visited the project, only 1.17 gallons of fuel were being used per ton of aggregate, despite the fact that the material had an original moisture content of 5 per cent. The plant was turning out, at the same time, 162 tons an hour.

When the aggregate tumbled down out of the drier, its temperature was checked by a Bristol remote indicating pyrometer. Resident Engineer Bill Weston tried to maintain an aggregate temperature of 275 degrees, with an asphaltic cement temperature of 310.

The hot, dry aggregate passed from the drier up a 22-foot totally enclosed bucket-line hot elevator, where it was dumped to a 4 x 12-foot screen deck. Two decks were used here, because the mix was a 2-bin pull. After being sized so approximately 50 per cent passed the No. 4 screen and the other 50 per cent passed the 1-inch, the material dropped down into 20-cubic-yard surge bins.

A 36-inch 3-compartment plate feeder, with calibrated gates to proportion the feed of material to the mixer, then moved the aggregate from the bins to the pugmill. This feeder was mechanically inter-connected to a Yale & Towne variable volume asphalt pump, which fed a positive volume of asphaltic cement, usually 5 per cent, to the pugmill to mix with the aggregate.

The Pioneer 8-foot twin pugmill, equipped with an anti-caking shell, took aggregate and 120-150 penetration asphaltic cement and mixed these ingredients about 30 seconds before the material was ready to dump. A haul road below the dump gate permitted 14 rented trucks to pick up their 8-ton loads and leave over the scales.

A plant foreman and two helpers operated the entire plant. The helpers oiled and did other odd jobs around the place, including the placement of some asbestos insulation around the asphalt and fuel oil tanks. The Cleaver-Brooks steam generator was a fully-automatic machine, so the operator simply set it at the steam pressure he wished it to maintain, and then checked it occasionally to see that the automatic electrical controls were working.

A few additions to the portable features of the Pioneer plant are contemplated for the idle period this coming winter. Kiewit's organization has developed a one-unit trap, feeder, and conveyor. The idea worked fine when it was tried out initially in a sand pit near Torrington, Wyo., and officials are now considering its adoption on the hot plant.

The single unit device will also be mounted on wheels with rubber tires, to make that part of the auxiliary equipment 100 per cent portable. It is expected that the fuel and asphalt tanks will also be cradled on heavy trailers. When that is done, the plant can be dismantled rapidly, moved to the next job, set up and started in a few days' time. The Kiewit organization has many projects under construction, and it gets the most out of its equipment by split-second schedules and capacity operation.

C. & E. M. Photos

Early in the day, a Buffalo-Springfield 3-axle tandem roller works on bituminous pavement which Kiewit crews laid the previous day. In the next picture, Superintendent Miles Hughes (left) and Resident Engineer W. H. Weston go over job details together.

Laying the Pavement

Batch trucks from the hot plant hauled through the hot sun without having to cover their loads, for the haul was not long. A Barber-Greene Finisher laid the hot-mix material in two lanes, completing its work on alternate days. In other words, one lane was laid one day as far as production

(*Concluded on next page*)

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

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HIGH FREQUENCY — 3 VIBRATOR HEADS: 8,000 to 10,000 VPM and availability of three vibrator heads assure rapid as well as thorough consolidation of the stiffest mix concrete under all conditions.

28 FOOT REACH: Available with any length of shaft up to 28 feet. Maximum length makes hard-to-get-to places readily accessible — saves time by making frequent changes of vibrator location.

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GRINDING: Countershaft attachment for quick conversion to wet or dry concrete rubbing.

See this outstanding general-purpose electric vibrator at your Jackson Distributor or write for complete facts.

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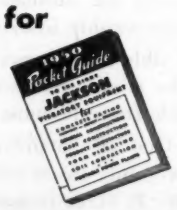

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ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON, MICHIGAN

Plant-Mix Surface Covers New Highway

(*Continued from preceding page*)

would take the crew, usually between 8,000 and 9,000 feet. The next day the machine started back at the same point, and finished the second lane. The first lane was laid to a string line established by surveyors, while the last lane met the previous center joint.

The trucks unloaded their material gradually, maintaining a full hopper on the Barber-Greene laydown machine. The operator crowded the lane just enough to throw up a tiny ridge of material along the longitudinal center joint. One man with a shovel combed the obvious large sized rocks out of this ridge. The first roll lapped about 12 inches over this joint, pressing the ridge down to eliminate all traces.

A 12-ton Buffalo-Springfield 3-axle tandem roller was used for the first few days, but because of the extremely hot weather it was too heavy. It was then taken to another job, and a smaller 8-ton Buffalo-Springfield tandem roller brought in. This cured the difficulty and made it possible to roll during the daytime heat, after the plant mix had cooled out a little.

Seal Coat Protects Pavement

A bituminous seal coat, designed to make the pavement water-repellent, was installed after the hot-mix had been placed. This consisted of 2/10 gallon of RC-2, with 17 pounds of ½-inch-minus armor chips per square yard. The RC-2, as in the case of all asphalt and asphaltic cement, was hauled by transport trucks from the Sinclair refinery at Sinclair, Wyo., west of Cheyenne. Four K-11 Internationals with 4,000-gallon trailer tanks made the run and arrived at the project with the oil still at application temperature.

In the case of the prime and seal coat oil, it was transferred directly to the Etnyre distributor and applied to the road. The asphaltic cement was unloaded to storage by a small Kinney asphalt pump. Armor chips were applied by a 12-foot Buckeye spreader, working on the back end of the dump trucks.

A new asphaltic concrete highway may be commonplace in many parts of the country, but the Kiewit project is one of the first such high-type pavements to be laid on the state primary highway system in eastern Wyoming. Many of the natives were simply entranced as they watched the Barber-Greene Finisher lay the material, leaving a silky-smooth finish behind.

Personnel

The job was handled under the general supervision of J. R. Bromley, Superintendent of the Wyoming Highway Department, with R. J. Templeton as Construction Engineer and W. H. Weston as Resident or Project Engineer. The work was built under the direction of Homer Scott, District Manager of the Kiewit Co. at Sheridan, Wyo., and of Miles Hughes, Superintendent, assisted by Paving Foreman Joe Bartu and Plant Foreman V. R. Choate.

Accidents don't happen, they are caused. Remember: safety always pays.

"CHAMPION"
4½ cu. ft. Contractor Size
WHEELBARROW

NO. 450 C-R
DISTRIBUTOR TERRITORY AVAILABLE
CHAMPION WHEELBARROW CO.
P. O. BOX 138 ● BYRON CENTER, MICH.

The Cancap exhaust protector is designed to cover pipe from 1⅜ to 1¼ inches.

Exhaust Protector

A new exhaust protector, Cancap, is now offered by The Canton Cast Products Co., 2408 13th St., N. E., Canton, Ohio. Its component parts consist of a malleable-iron cadmium-plated clamp with an aluminum cap. By completely overlapping the pipe, the top cover keeps out rain or snow and prevents sparks from causing damage in starting. The cap will not open in high winds, or when the tractor is parked on a grade, according to the manufacturer.

Three sizes are designed to cover all sizes of contractor's field equipment: No. 2 fits all exhaust pipes from 1⅜ to 2⅜ inches, No. 3 from 2⅜ to 3⅛, and No. 4 from 3⅛ to 4¼. This serves to limit the inventory necessary. No fittings or bushings are required for installation.

Further information may be secured from the company. Or use the Request Card which is inserted at page 16. Circle No. 45.

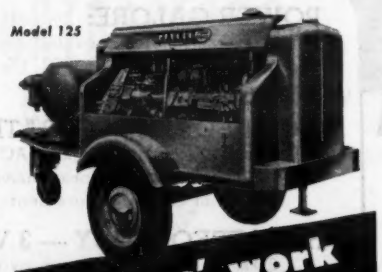
Pneumatic Concrete Work

Some of the Gunite concrete work done in the past few years by Gunite Concrete & Construction Co., 1301 Woodswether Road, Kansas City 6, Mo., is illustrated in a new 24-page catalog prepared by the company. The booklet explains fully what Gunite concrete is, its characteristics, and applications.

The main part of the book is devoted to photographs taken before and after the application of Gunite concrete in lining, fireproofing, renovating, repairing, and waterproofing operations. Engineering drawings illustrate standard details for coating, building walls, reservoirs, and steel storage tanks. All features of Gunite construction are fully explained.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 156.

Model 125



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"new standard"
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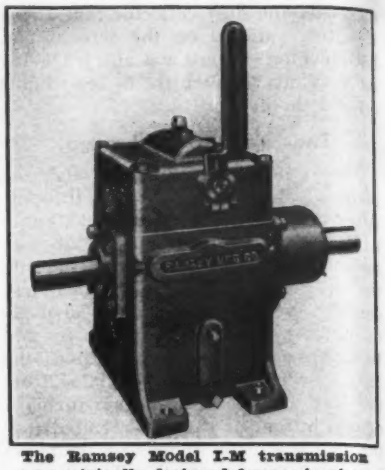
Columbus 16, Ohio

New Transmission

An industrial transmission designed for heavy-duty applications with ½ to 5-hp motors has been announced by Ramsey Mfg. Co., 5531 E. Admiral Place, Tulsa, Okla. The Ramsey Model 1-M transmission was originally designed for use in pipe-cleaning and pipe-wrapping machines, but may also be used for driving other types of machines which require several operating speeds. Three forward speeds and reverse are provided. Forward speed ratios are 1 to 1, 1¾ to 1, and 3 to 1. Reverse speed ratio is 4 to 1.



The Ramsey Model 1-M transmission was originally designed for use in pipe-cleaning and pipe-wrapping machines, but may also be used for driving other machines requiring several operating speeds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 67.

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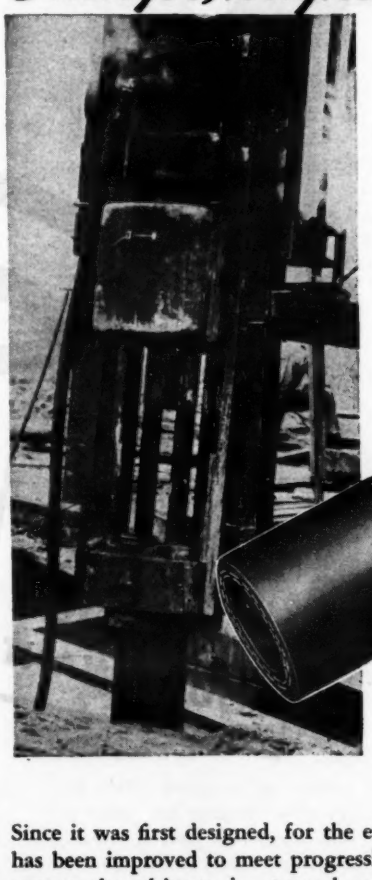
Stronger, Tougher, Safer Than Ever



FOR CONTINUOUS SERVICE UP TO 200 lbs.—400°F.

Since it was first designed, for the earliest steam hose applications, "Inferno" has been improved to meet progressively higher requirements. Today, it represents the ultimate in steam hose construction—a masterpiece of quality craftsmanship insuring unequalled strength, durability and safety.

Flexible steel sinews have been added to the carcass. A tough, red cover provides greater resistance to abrasive wear and all kinds of weather. The tube is made from the most efficient rubber compound ever developed for steam.

A Goodall "Standard of Quality" product, for pile driving and all other heavy-duty steam jobs, at pressures up to 200 lbs. and steam temperatures to 400° F. Made in sizes ½" to 2", I.D., in maximum lengths of 50 feet.

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Water and Sewage Utilities Are Improved

(*Continued from page 1*)

reservoir, rebuilding of present reservoir; new service pump, controls, and color-removal facilities.

Sanitary Sewerage Facilities

Projects 1 and 3 for the sanitary sewerage facilities were awarded to the J. I. Newton Co. of Tifton, Ga. Project 1 included laying 1,697 linear feet of 18-inch reinforced-concrete pipe in cuts from 14 to 28 feet in depth. Of the total pipe, 750 feet were laid in 24 to 28-foot cuts. The contract also called for tunneling 175 feet of cast-iron pipe in 22 to 28-foot cuts as the sewer passed under the tracks of the Atlantic Coast Line Railroad; and construction of 8,000 feet of 8-inch vitrified-clay gravity sewer lines at a contract price of $31,000.00. Another work item included the construction of five manholes. The successful low bid on Project 1 was $59,881.00; of this figure $29,879.52 represents the big deep line. Work started in January, 1949, and was completed in June.

Project 3, totaling $212,656, was divided into two parts. Part A, for $179,406, included 65,000 linear feet of vitrified-clay sewer pipe, 6 to 18-inch, laid in cuts up to 16 feet in depth. However, of this amount of pipe, 29,150 feet was 8-inch-diameter and was laid in cuts from 4 to 6 feet deep, and 4,412 feet was 18-inch concrete pipe in 6 to 12-foot cuts.

Part B of project 3 included the construction of two sewage lift stations for $33,250. The Rogers Street lift station, or No. 3, contains two 450-gpm pumps. Work on project 3 got started on March 30, 1949, and is scheduled for completion early in 1950. Project 2 was awarded to the J. B. McCrary Engineering Co. of Atlanta, Ga., on its low bid of $128,600. This contract was also divided into two parts, part A for pipe work being $112,600, and part B, at $16,000, for the construction of the Wisenbaker lift station with two 550-gpm pumps. The pipe totaled 38,296 linear feet of vitrified-clay sewer lines, of which 31,799 feet was 8-inch-diameter, laid in cuts up to 12 feet. Of the remainder, 6,483 feet of 10-inch pipe was laid in cuts up to 14 feet in depth, while the final 14 linear feet of 15-inch pipe was put down in 8 to 10-foot cuts. This contract also included 146 manholes. Work started in March, 1949, and was scheduled to be finished by October 20, 1949.

On August 10, 1949, a contract was awarded to J. B. McCrary Co. in the amount of $30,823.00 for the installation of 600 water service connections, and 600 sewer service lines.

On July 27, 1949, a contract was awarded to Layne Atlantic Co., Albany, in the amount of $35,000.00 for the installation of a deep-well pump electric motor and diesel stand-by power unit, and for construction of a well pump house including chemical feeders and all necessary controls.

Water Distribution System

The J. B. McCrary Engineering Co. was also awarded the main contract for the improvements to the water distribution system on its low bid of $338,217.30. Pipe laying started in December, 1948, and was completed in August. The pipe is cast-iron with bell and spigot joints which are calked with lead, and ranges in size from 2 to 14-inch-diameter. The contract included making the necessary cut-ins to existing lines. The different pipe sizes and the footages involved were as follows:

14-inch	500 lin. ft.
12-inch	29,600 lin. ft.
10-inch	2,000 lin. ft.
8-inch	750 lin. ft.
6-inch	25,500 lin. ft.
4-inch	100 lin. ft.
2-inch	44,250 lin. ft.
Total	102,700 lin. ft.

The 2-inch size of pipe was used chiefly for connections between larger mains. The 12-inch line makes a huge loop around the city to tie in the new elevated tanks to the old and new water distribution systems.

Boon to Valdosta

Valdosta, the county seat of Lowndes County, has an area of approximately 5 square miles, and is roughly rectangular in shape, the longer side being on a north-south axis. It ranks twelfth in population in the state with about 20,000 residents. Its daily consumption of water averages 1,500,000 gallons, but in the summer, peaks of 3,000,000 gallons are not uncommon. Water is supplied from two deep wells, one with a capacity of 1,200 gpm from an electric pump that has a diesel stand-by engine, and the other operated by a steam pump that supplies water at the rate of 800 gpm. The first step in the improvement was to add a new 1,500-gpm well with an electric pump at the site of the

(*Continued on next page*)

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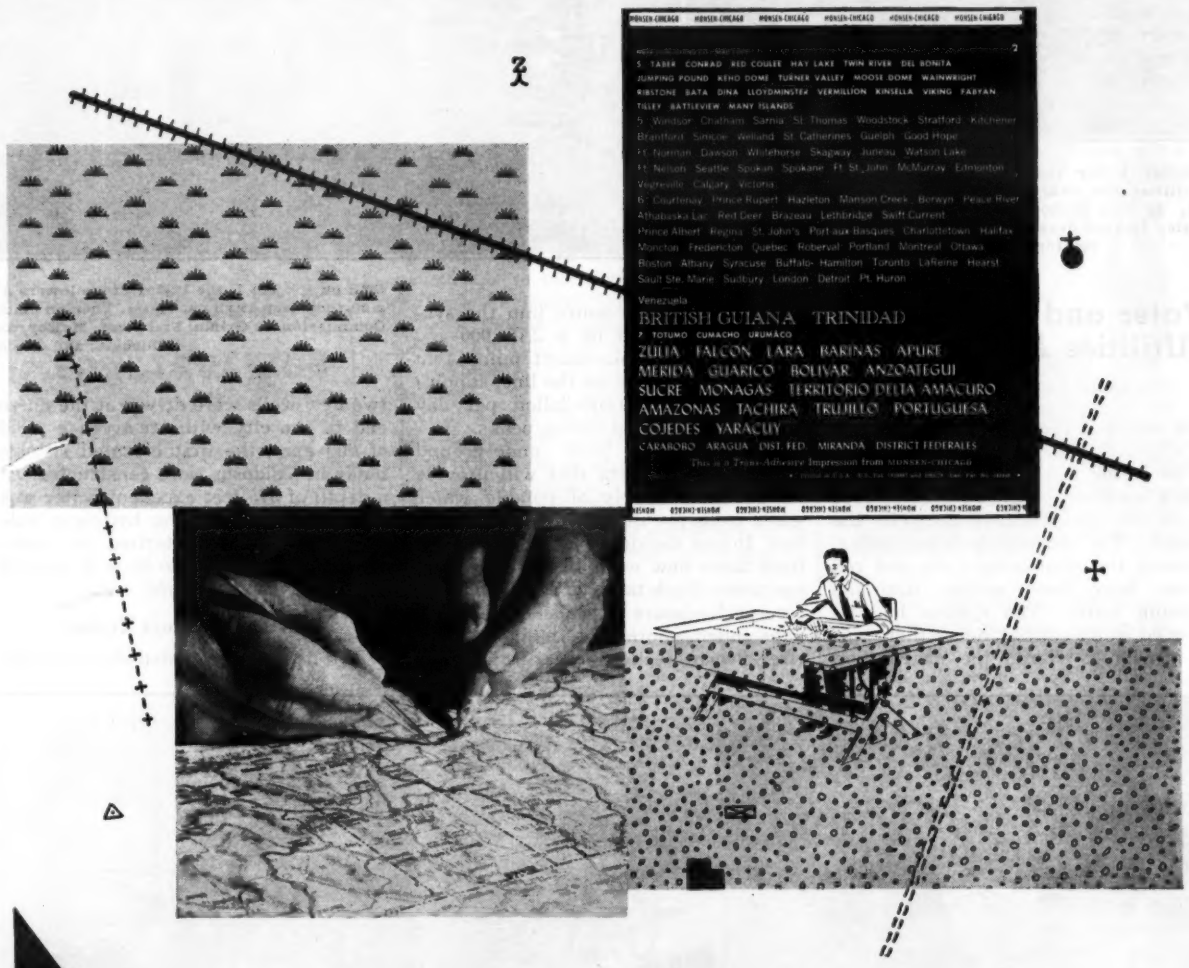

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C. & E. M. Photo

Project 1 for the Valdosta, Ga., sanitary sewerage facilities was awarded to the J. I. Newton Co. of Tifton, Ga. In this photo taken on the Newton contract, an Insley ½-yard dragline excavates a ditch for the 18-inch reinforced-concrete sewer line.

C. & E. M. Photos

Still on Project 1, the Insley crane lowers a section of 18-inch reinforced-concrete pipe into a 20-foot-deep ditch cut (left). Then an official party inspects the job: Councilman Minchew; Commissioners Griffin, Steinberg, McKey, and Beck; Valdosta Mayor Mathis; City Engineer Burnett; and Resident Engineer Burdick.

Water and Sewage Utilities Are Improved

(Continued from preceding page)

waterworks in the downtown section of the city.

The water is stored in a 1,000,000-gallon concrete surface reservoir, 35 years old, and 20 feet deep in the ground. The concrete is deteriorating, exposing the reinforcing rods, and red worms have been getting into the drinking water. The system had no elevated water storage, hence there was no gravity flow into the distribution system. Direct pressure into the system is maintained by a 2,750,000-gpd steam-driven displacement pump that operates constantly on the line, supplemented by a 750,000-gallon per day duplex steam pump during peaks.

Valdosta does have underground water-bearing strata that will provide an adequate supply of potable water when wells are driven into these aquifers. It was decided to store the water from these new wells in elevated storage tanks. Such tanks provide sufficient reserve for hours of peak usage, eliminate much continuous pumping, and offer fire-protection reserve. So when two new wells were driven at the north end of the city with an average yield of 600 gpm, the first elevated storage tanks in Valdosta were constructed. At a depth of 375 feet excellent water was obtained, free from the hydrogen sulphide gas that characterized the existing water which had to be well aerated to remove the taste and odor.

Elevated Storage Tanks

Two new steel elevated storage tanks were fabricated and erected by the R. D. Cole Mfg. Co. of Newnan, Ga., at a cost of $71,000. Concrete foundation footings for both tanks were constructed by the Wainer Construction Co. of Valdosta under a separate $7,780 contract. The larger tank, with a 300,000-gallon capacity, is supported on a steel tower, 133 feet high to the overflow line. It is located in the south end of town. The smaller 100,000-gallon tank,

(Continued on next page)

C. & E. M. Photo

On Project 3, also awarded to the Newton Co., a workman pours G-K compound to seal joints in 8-inch vitrified-clay pipe. The ditch cut here is 6 feet deep.

Photo courtesy of Valdosta City Engineer

Project 2, shown in this photo, was awarded to the J. B. McCrary Engineering Co. The sewer pipe going in here is 8 inches in diameter and the ditch cut is 10 feet deep.

C. & E. M. Photo

Along with the sanitary-sewer work at Valdosta went improvement in the water distribution system. R. D. Cole Mfg. Co. fabricated and erected two water storage tanks. This is the larger 300,000-gallon one supported on a riveted steel tower 133 feet high.

110 feet high, is in Pendleton Park at the north end of Valdosta. The steel towers supporting the tanks are riveted, while the tanks themselves are double ellipsoidal in shape, made of riveted steel plates.

With the 300,000-gallon tank, the center cylindrical column carrying the water is 4 feet in diameter; it also contains two 6-inch-diameter pipes. One of these smaller-sized pipes is for the blow-off or overflow, while the other provides for mud drainage. A 14-inch main feeds the water from the tanks to the system. The entire structure, tower and tank, was erected with a single, steel, 45-foot gin pole, operated through two winches—one for lifting the material, and the other for maneuvering the members around until they were in position. Erecting was done in 33-foot sections at a time, with the gin pole working from the top of the big water pipe. As another section was added to the 4-foot pipe, the gin pole lifted itself to the top of the new piece and built up the tower framework around it. Lifting was done with a Jaeger two-drum hoist driven by a gasoline engine. Maneuvering and setting members was handled by an Ingersoll-Rand pneumatic hoist powered by an I-R 105-cfm compressor.

The elevated tanks will supply water to the city distribution system at 60-pound pressure, which is the pressure that the various valves have been designed for. Besides these two new tanks, the ultimate city plan includes the construction of a third tank holding 500,000 gallons. The city by public referendum extended its boundaries effective Sept. 1, 1949, to include about 3 additional square miles of area; this brings even more people within the scope of the Valdosta water supply. The 12-inch line now running around the perimeter of the city will feed the smaller-size pipes branching off it.

Laying the Pipe

The J. B. McCrary Engineering Co., which held contracts for laying both water mains and sewer lines, was furnished the cast-iron water pipe by the National Cast Iron Pipe Co. It came in 18-foot lengths from Birmingham, Ala. For the sewer work the reinforced-concrete pipe was supplied by the Massey Concrete Pipe Co. of Birmingham, Ala., while the clay pipe came from the Georgia Vitrified Clay Co. of Augusta, Ga.

On this contract the trenches for the larger pipe were excavated by two ½-yard machines — an Insley and P&H—set up either as backhoes or draglines; the latter with 35-foot booms. Trenches up to 5½ feet in depth were dug by two Cleveland trenchers. Short sections were opened at a time and kept unwatered with about a dozen pumps—Jaeger, CMC, Marlow, and Domestic—ranging in size from 2, 3, and up to 4-inch units.

Concrete pipe for the J. I. Newton Co. sewer contract came from the Miller Concrete Pipe Co. in Valdosta, while the clay pipe was supplied by the Oconee Clay Products Co. of Milledgeville, Ga. Both types were delivered by truck. Trenches for the larger pipe were excavated by an Insley ½-yard dragline with a 35-foot boom, and a Lorain 1½-yard dragline with a 55-foot boom. Trenches for pipe up through 10-inch diameter were dug by a Bucyrus-Erie 44C ditcher that cut a 24-inch-wide trench to a depth of 8½ feet. Dewatering of trenches was done with 5 Jaeger pumps, 1½ to 3-inch in size, and 3 Homelite 3-inch pumps.

Up to 12-inch pipe was set by hand; the larger-diameter pipe sections were handled by either the cranes or by a Caterpillar D4 tractor equipped with an 18-foot A-frame and a Hyster winch. Both contractors employed small, easily maneuvered tractor-dozers in making the backfill over and above the pipe lines.

Open Cut

All the pipe was laid in open-cut trenches with the exception of a section that was tunneled under a four-track railroad line. Little sheeting was required on the job, for where the deep 28-foot trenches were located, enough space was available to bench back and excavate in wide cuts. The sand and hard clay strata of the earth also held more or less to the slope lines.

Joints in the gravity sewer line were calked with G-K compound. Before pipe was placed in the trench, the outside of the spigot and the inside of the bell were cleaned, wiped dry, and painted with a coat of bitumen prime. When the ends were connected, an asbestos joint runner was put on and the joints were poured from the top so that the G-K compound completely filled the space. The compound had been heated to an average temperature of 300 degrees F, and as it cools the material expands, thus making a tight joint.

(*Concluded on next page*)

WIND-PIPES FOR UNDERGROUND CONSTRUCTION

NAYLOR PIPE is the practical answer for ventilating problems

No other light-weight pipe offers so many advantages for push-pull ventilating service. The Naylor Lockseam Spiralweld creates a stronger light-weight pipe with greater collapse strength. A lighter gauge pipe can be used in this service without sacrifice of strength due to this distinctive structure. The larger the diameter, the more this is true.

Naylor Pipe is accurate in diameter. It holds its true cylindrical form. Ends always match correctly so that the line is tight and leakfree.

Also, Naylor's exclusive Wedge-Lock Coupling speeds installation and allows joints to be made up with only one side of the pipe in the open.

All these factors add up to greater performance and economy for contractors. It will pay you to write for Naylor's catalog, Number 44.

Sizes from 4" to 30" in diameter—thicknesses from 14 to 8 gauge. All types of fittings, connections and fabrications.

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RICE PORTABLE *Self-Priming* CENTRIFUGAL PUMPS

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The McCarthy Vertical Drill, manufactured by The Salem Tool Co., is adaptable to high wall and key way drilling and diamond drill boring . . . drills 90% of all limestone and sand rock formations, and readily burrows through shale. Send today for complete information, and for a free copy of The Salem Tool Company booklet.

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THE TRADING POST, CONTRACTORS & ENGINEERS MONTHLY
470 4th Avenue, New York 16, N.Y.

Water and Sewage Utilities Are Improved

(*Continued from preceding page*)

At present the sewage empties into Little River west of the city. Eventually a new sewage-disposal plant will be constructed in Valdosta. Since these contracts have been awarded at prices well within the engineers' estimates, the savings will permit additional work not included in the first stage of improvement. As sections of the city not now reached by either water or sewage lines come within the scope of the betterment, the old wells and hand pumps will no longer be needed, and the septic tanks and outdoor privies will disappear.

Personnel

The J. I. Newton Co. was represented on the project by J. I. Newton himself, while R. R. Cardell was Superintendent for the J. B. McCrary Engineering Co.

Wylie W. Gillespie of Smith & Gillespie, the consulting engineers on the design and construction, directed the undertaking, with Robert W. Burdick as Resident Engineer.

For Valdosta, Carey C. Burnett the City Engineer supervised all the construction contracts. J. Ed Mathis is Mayor of the city, and Carl D. Minchew is Chairman of the Sanitary Committee. J. D. McKey is Chairman of the Waterworks Committee.

Diesel Engineering Text

"Elements of Diesel Engineering" by Orville L. Adams, Sr., is intended to be just what the name indicates—an introduction to and a study of the basic principles of diesel engines for those who know little, or nothing, about diesel engineering. The second edition of the book, recently published, is practically a new text, since it contains over 90 per cent new material. The information it contains is applicable to automotive, locomotive, stationary, and marine diesel engines.

The subjects treated in the work include diesel definitions, diesel-engine mathematics, fundamental engine cycles, fuel-injection systems, combustion and heat distribution, methods of rating and testing, air intake and supercharging, interpretation of diesel indicator diagrams, diesel fuel and lubricating oils, fuel properties, and engine performance. The book also offers a check list for diagnosing diesel-engine troubles and suggests remedies to be applied.

Published by The Norman W. Henley Publishing Co., 254 W. 54th St., New York 19, N. Y., the book costs $5.00.

Heavy-Equipment Trailers

A catalog on Mead Hevitrailers is available from Mead Machine & Iron Works, Inc., 606 Lexington Ave., Warren, Pa. Illustrations and specifications are given for dump-truck semi-trailers with capacities of 10 to 15, and 18 to 25 tons, and for the conventional gooseneck types with capacities of 10 to 15, and 18 to 25 tons. The Mead catalog points to the neck and fifth-wheel adaptations for dump-truck semi-trailers as being uniquely engineered. Photographs and drawings highlight the significant design features of the vertical telescoping adjustment, fifth wheel, and mat assembly.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 115.

American-Coleman V. P.

J. H. Agee of Lincoln, Nebr., has recently been elected Vice President of the American Road Equipment Co. and the American-Coleman Co., of Omaha, Nebr. He brings to these firms many years of experience.

Designed for maneuverability and quick job-to-job moves, the Cleveland Model 92 Baby Digger will dig trenches 5 feet deep and 10 to 20 inches wide.

Trenching Machine For General Service

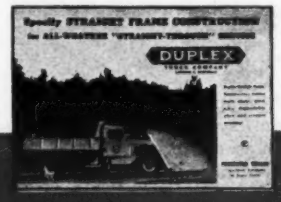
A new compact trenching machine has been placed on the market by The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio. Known as the Baby Digger Model 92, it is designed for easy maneuvering in tight places and quick moves from job to job on its own rubber-tired tilt-bed electric-braked trailer. It will dig up to 5 feet deep and 10 to 20 inches wide. Features claimed for the 92 are: clog-proof crawler tracks; operator-controlled power-shift conveyor; patented Presto-Points for replacement of rooter teeth; and a crumbling shoe which can be swung up and away to permit digging right up to foundations, walls, and trees.

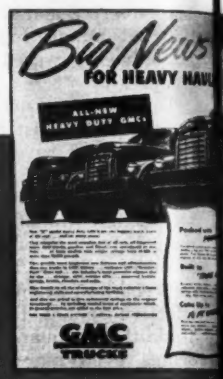
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 141.

Mobile Tractor Power Saw

A fully illustrated folder on the Tipsaw, a power saw designed for tractor mounting, is available from Tips Engine Works, 300 Baylor St., Austin, Texas. The bulletin features the Tipsaw, with its 30-inch blade, mounted on a Gibson tractor engaged in clearing and cutting operations. The saw can be mounted on other makes of tractors, too, the bulletin says.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 102 and state the make and model of tractor for which the saw is desired.





These twelve truck advertisements have appeared in recent issues of Contractors and Engineers Monthly.

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Modern engineering construction would be impossible without trucks. And to carry their sales message to the entire construction industry, most truck manufacturers place their advertising in CONTRACTORS AND ENGINEERS MONTHLY.

They know that C&E Monthly gives them balanced coverage of all the equipment buying groups including: contractors, project superintendents, state and county highway engineers, public works officials, and equipment distributors.

If you're selling trucks or tires, oil lubricants or any other automotive product, C&E Monthly can aid your sales in the highway and heavy construction industry. For that matter, regardless of what you are selling, if the construction field is your market it will pay you to investigate the advantages of CONTRACTORS AND ENGINEERS MONTHLY.

the NEWSpaper of highway and heavy construction

Heavy Earth-Moving Starts Hospital Job

A new $8,000,000 Veterans Hospital is going up at Madison, Wis., on what was once a high hill, thickly covered with trees. Before construction could begin, 220,000 yards had to be excavated and 23 acres of big elm, maple, oak, and ash trees had to be cleared.

The contractor, Newberg Construction Co. of Chicago, used an Allis-Chalmers HD-19 tractor to butt down the trees. The hill was carved out by 3 Allis-Chalmers HD-19 tractors with Baker dozers, Gar Wood scrapers, and big power shovels.

The heavy-excavating crew and machinery was then reinforced by an army of men which will reach a peak of 600 at the height of construction. All of the concrete work on the three main buildings, each eight stories high, will probably be finished by the end of this year. Concrete work on four auxiliary buildings is expected to be finished by next June. The general contract allows 731 days for completion.

Three Allis-Chalmers HD-19 tractors with Baker dozers and Gar Wood scrapers work a 220,000-yard excavation for an $8,000,000 Veterans Hospital at Madison, Wis. Newberg Construction Co. is doing the job for the Army Engineers.

Arnold Anderson is Superintendent of construction, and John Brey is Resident Engineer on the job for the Army Corps of Engineers.

Connecticut Reorganizes Its Highway Department

To integrate its work more closely and to give a greater return for money spent, the Connecticut State Highway Department is being reorganized, Commissioner G. Albert Hill has announced. Field engineering functions, formerly divided among the bureaus at Hartford headquarters and 19 field offices, will be brought under the supervision of district engineers. And all Hartford engineering functions will be merged under a single bureau. The changes will be effected within existing legislative appropriations, and without increase of total personnel, demotions, or loss of merit-system titles or salaries.

In each district, working with the district engineer, there will be a maintenance engineer, a construction engineer, an engineer of plans and surveys, and an office engineer. Crews performing related duties will no longer work for a single bureau but will move from task to task carrying out the scheduled operations of the district.

The new Bureau of Engineering at Hartford will carry on all phases of engineering. It will handle all location and design work of the former bureau of engineering and construction, all operations of the former bureau of highway planning studies, and traffic-engineering functions of the division of highway control.

The Bureau of Right-of-Ways will retain all its present duties except for field work on boundaries, which will be handled by the districts. The Bureau of Materials Engineering will continue to operate the department laboratory, but field inspectors will work as part of the district construction forces. The Bureau of Business Administration will include a contract section, formerly attached to the engineering bureau; an audit section, which formerly reported directly to the Commissioner; and a town-aid division, formerly a separate bureau. Field work of the former town-aid bureau will be performed by the districts.

Working with the Deputy Commissioner and Chief Engineer as technical advisers to the Commissioner, there will be an assistant chief engineer, the maintenance engineer, the roadside development engineer, and the construction engineer. The group will be responsible for keeping the policies and operation of the districts on a uniform basis.

Son Steps in for Father At Marquette Cement Co.

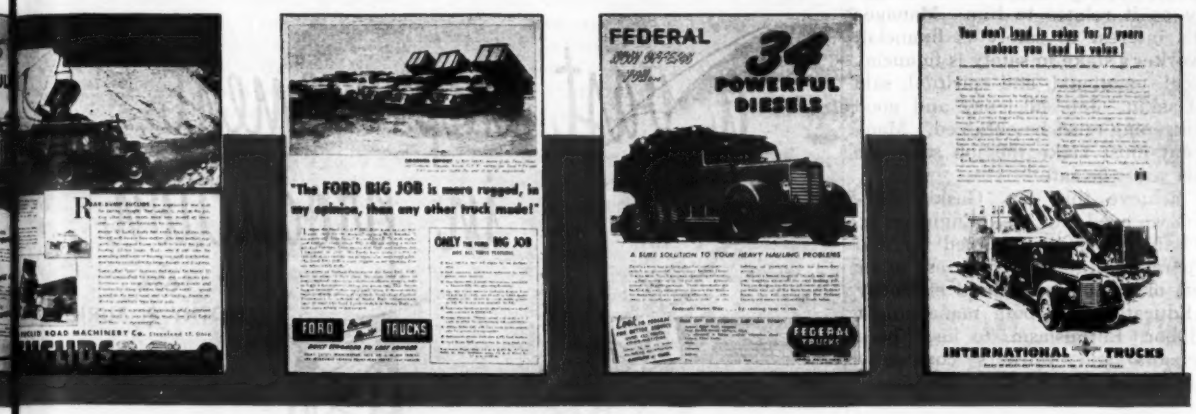
In October, Charles E. Stiver succeeded his father, Chris E. Stiver, as sales representative in southeastern Missouri for Marquette Cement Mfg. Co. The senior Stiver retired in September after 25 years of service with Marquette.

Three Series of Trucks

Three catalogs on the series F-6, F-7, and F-8 trucks are available from the Ford Motor Co. of Dearborn, Mich. They present all features and specifications of the Ford Bonus-Built trucks.

These trucks have gross total weights of 28,000, 35,000, and 39,000 pounds, respectively. The F-7 and F-8 series feature a 145-hp V-8 engine with 5-speed helical-gear transmissions, either overdrive or direct drive. Engine performance curves and dimensioned engineering drawings of the chassis are given for each of the models.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 125.


"The FORD BIG JOB is more rugged, in my opinion, than any other truck made!"
FORD TRUCKS
FEDERAL
34 POWERFUL DIESELS
A SURE SOLUTION TO YOUR HEAVY HAULING PROBLEMS
You don't load in value for 17 years unless you load in value!
INTERNATIONAL TRUCKS

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Contractors and Engineers Monthly

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Safety Pays Off In Job Profits

Why It Pays to Make Jobs Safe and How to Do It Are Discussed at Safety Congress; New Officers

✦ ACCIDENT prevention pays off in dollars-and-cents savings through more efficient and profitable jobs and lower insurance rates. This was the message of the principal speakers at the Construction Section meetings of the 37th National Safety Congress held in Chicago, October 25-26. Some 250 delegates attended the sessions.

Safety Always Pays

Mervyn G. Gaskin, President of Taylor & Gaskin, Inc., steel-erection firm of Detroit, Mich., challenged the group to find a successful contractor who will say "costs are nothing to me"—who does not know the cost of his materials, of labor, of equipment. But, Mr. Gaskin said, many cost-conscious contractors are unaware of the cost of accidents which do or may occur.

Today, in the construction industry, he pointed out, competition is keen and cost reduction vital. This necessitates efficiency in every department. Anything which affects labor and its productivity affects job costs. "An accident," stated Mr. Gaskin, "is a symptom of something wrong in the production process—in men, materials, equipment, or methods."

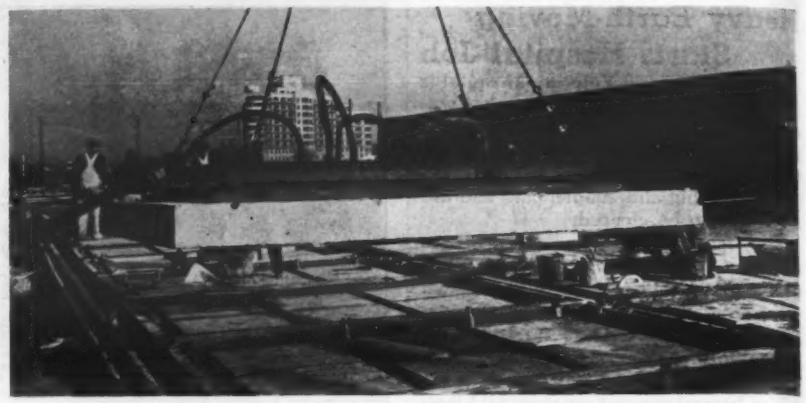
The direct losses due to accidents are readily identified; the others, less so. Spoilage and damage to equipment and materials, decreased production, lost time not only of those involved in the accident but of all the men on the job, amount to from 2 to 10 times the known cost of the accident. Such losses, said Mr. Gaskin, are the price of inefficiency and lack of control.

Mr. Gaskin cited his own experience and that of other companies in the Detroit area in achieving substantial dollars-and-cents savings through reduction in insurance premiums. In one case, a reduction from $31.50 to $12.11, due to planning for job safety and the resulting improvement in the firm's safety record, saved the company $584,000. Another contractor saved $81,000 a year in premiums; still another, $95,000.

Accident prevention is the everyday responsibility of the foremen, the superintendents, and the contractor himself, Mr. Gaskin believes. In addition to such safety equipment as hard hats, goggles, safety belts, etc., job safety must be planned for as part of the job operation. Every man must be taught safety as it relates to him. Management's interest in safety is financial; the worker's stake in safety is financial, physical, emotional, and spiritual, said Mr. Gaskin. Job efficiency and good housekeeping must be enforced. Management must make the job safe; the worker must *be* safe.

To achieve this, Mr. Gaskin concluded, we need four E's: Engineering, since safety must be planned for and incorporated into the job as other aspects of job operation and efficiency are; Education, for both management and labor; Enthusiasm, to keep both supervisors and workers constantly

(Continued on next page)



The Vacuum Concrete Lifter removes slabs when only twelve hours old.

Vacuum Concrete Precasting Doubles Speed of Construction. Write for information and literature.

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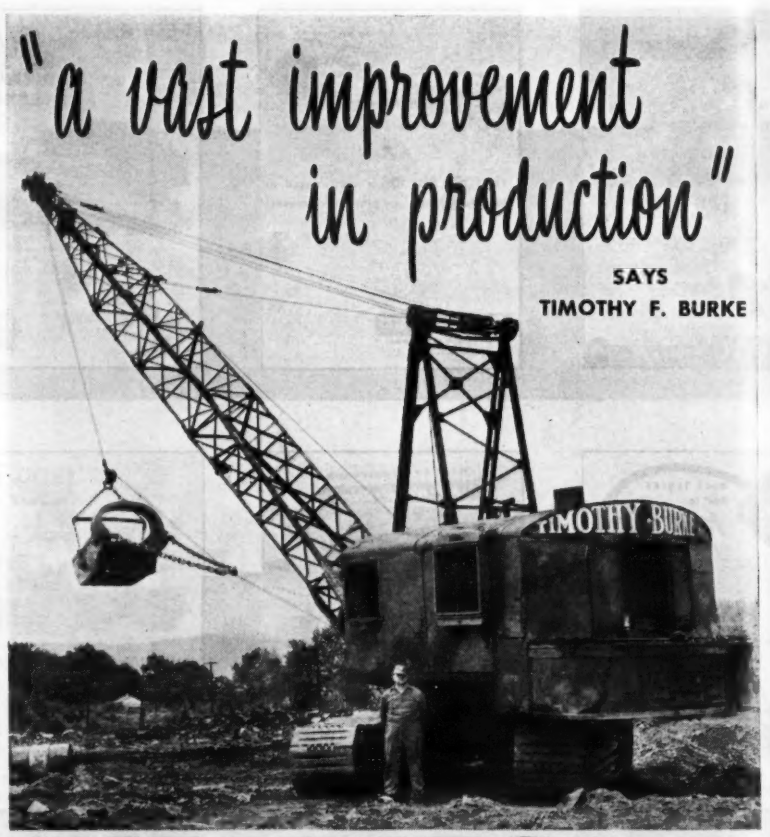
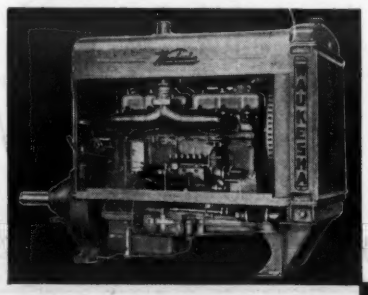


WAUKESHA Diesel POWER

● Timothy Burke, Inc., of Scranton, Pa., have been excavating engineers for 67 years—in railroad and dam construction—and, for the past 32 years, coal stripping in the Anthracite region. Right now they're operating eighteen shovels and draglines. With their experience, they *know* a good engine when it comes on the job . . .

Here's what their Mr. Timothy F. Burke, Vice-Pres. and Gen. Mgr., says: "We installed a Model 148-DKU Waukesha Engine in our Northwest Model 85 Dragline to replace a gas engine (of another make) and we are very pleased with the performance . . . We have noted a vast improvement in production, and with regards to efficiency and economy, we can say the results have been very satisfactory." Easy to start, too, these Waukesha Diesels, and smooth . . . snappily responsive to all power and load demands.

Auto Gear & Parts Company, Inc., of Philadelphia, conversion specialists, supplied this Waukesha Diesel and installed it. Ask your distributor about Waukesha Diesels. Send for Bulletin 1414.



Model 148-DKU WAUKESHA DIESEL—Six cylinders, 5¼-in. x 6-in., 779 cu. in. displacement, 180 hp. maximum.

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STOPS MOISTURE FROM FALLING INTO TRACTOR EXHAUST . . . Just slip the "RAINCAP" over the open end of your tractor exhaust, and you eliminate forever the danger of moisture falling into the exhaust, injuring your tractor

THE CAP THAT DOES NOT FORGET TO CLOSE . . . Completely automatic—the "RAINCAP" is counter-balanced to open when the tractor starts and close when it stops. Rust proof—made of cast aluminum with bronze bushing—can be installed in two minutes F.O.B. Waterloo, Iowa

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Immediate delivery

Liberal dealer discount

No.	O.D. Exhaust	Retail
1	2 1/8"	$1.90
2	2 3/8"	1.90
3	2 3/4"	1.90
5	1 7/8"	1.90
55	2"	1.90
5x	1 3/4"	1.90
6	1 1/2"	1.90
66	1 3/8"	1.90
7	2 1/2"	1.90
8	3"	2.50
9	3 1/8"	2.50
10	3 1/4"	2.50
11	3 1/2"	2.75
115	3 3/4"	3.00
12	4"	3.00
123	4 1/8"	3.00
125	4 1/4"	3.00
14	4 1/2"	3.00

WATERLOO FOUNDRY CO., WATERLOO, IOWA

S. Edward Frank & Associates Photo
Fred I. Rowe, of W. L. Johnson Construction Co., tells the Construction Section, National Safety Congress, why and how his company plans and secures safety on jobs.

alert; and Enforcement, to make the accident-prevention program really work.

Ingenuity pays off too, said Robert L. Jenkins, Chief, Safety Division, Office of Chief of Engineers, Department of the Army, Washington, D. C. Mr. Jenkins showed a series of slides depicting how a little thought and ingenuity have devised means not only of protecting workmen from hazards but also of increasing job efficiency.

Many of the factors which have contributed to the tremendous advances made by the construction industry since 1912—mechanization, speed-up of machines and work, etc.—have also contributed to the somber accident records, Mr. Jenkins said. However, thought and ingenuity are overcoming many of these, and the construction accident record is improving.

Some of the methods and devices contributing to job efficiency and safety which Mr. Jenkins described and illustrated included Lucite guards for saws, which provide complete vision as well as protection for the operator; simple covered drinking-water containers or fountains which, he reported, cost less than the old "water-boy" system; flasher lights on construction and maintenance equipment which often present a night hazard to others; and the use of reflectorized paint on highways and on workers.

Handling materials has always presented a problem and a hazard to workers. Several types of simple cranes mounted on trucks or tractors were shown handling steel, pipe, drums, and other materials—cutting down on the number of men needed for the task and eliminating the possibility of injury, strained backs, hernia, etc. Another suggestion was guide blocks instead of men to spot hoisted loads. Good housekeeping in unloading and storing material on the job eliminates the wasted time and motion of walking over or around piles of material dumped just anywhere, as well as the hazard they present. A simple hoisting plate which slides into steel piling permits the men to stand clear as the piling is lifted into position. And a bell and flashing light warning of a backing truck not only saves time but cuts down on one of the most common types of accidents.

Brush clearing is another operation in which injuries frequently occur. One contractor devised a rig of two tractors with a cable between them for knocking down brush and low growth so that it could be readily and quickly piled up by a bulldozer. A special tractor rig with fuel drums and blower quickly ignites piles of brush to be burned, and eliminates hand tending of such fires, along with the hazard involved. Another tree "stunt" was a circular saw on the end of a boom mounted on a tractor for quick and safe tree topping.

To society, Mr. Jenkins concluded, such devices mean lives saved and human and natural resources conserved; to construction they mean greater efficiency and lower costs.

Gambling With Safety

"A gambler is a fellow who takes unnecessary chances—who bets on the long shots," said Fred I. Rowe, W. L. Johnson Construction Co., Columbus, Ohio, third speaker at the meeting. There is no more need for the small and medium-size contractor to gamble on accidents than for the big fellow to do so, Mr. Rowe said. Safety on the job is the function of management, he believes; it can get help from outside, but there is no more reason to expect one's insurance company to provide safety on the job than to expect it to carry on the construction.

Mr. Rowe showed an excellent and very effective color film illustrating how W. L. Johnson Co. incorporates accident prevention in its job operation and dramatizing the results when safe practices are ignored.

The company's general plan is this. When a contract is awarded, the superintendent analyzes the job and how it will be set up and run. He figures out what the major hazards are likely to be, as shown by previous experience. He makes out a report which is studied, and added to if necessary, by Mr. Rowe, and then is given to the foremen. A committee is set up, composed of a representative of management, of the crafts, and of the laborers on the job. This personnel changes weekly, and each member gets $5. This committee inspects the job in operation and makes reports to the Superintendent which then go to Mr. Rowe. Informal noontime talks by the foremen, analyzing the immediate work ahead and establishing the proper methods, are an important part of the plan.

Some of W. L. Johnson's methods of safe job operation, shown in the film, include good housekeeping, proper work clothing, protection to drivers of trucks being loaded with rock, adequate props for dump bodies when work is being done on hydraulic systems, and painting the tops of all equipment yellow to make them visible.

Any safety program requires constant vigilance and inspiration, Mr. Rowe says. He believes that men are still boys at heart and that they like badges, awards, contests, and prizes. His company takes advantage of that fact to promote safety on its jobs.

Equipment Safety

A feature of the second session was a panel discussion of the question "How Can Construction Equipment Operations Be Made Safer and Better?" Harold W. Richardson, Editor, *Construction Methods and Equipment*, New York City, was moderator. Speaking for the contractors who use this equipment were: Fred I. Rowe, W. L. Johnson Construction Co.; Gunnar Anderson, Steel-Erection Superintendent, Taylor & Gaskin, Inc., Detroit; F. C. Wardwell, General Superintendent, Stone & Webster Engineering Corp., Whiting, Ind.; George L. Martin, Vice President, Bates & Rogers Construction Corp., Chicago; and Taylor L. Soper, Executive Secretary, Illinois Road Builders' Association, Chicago. Representing the manufacturers were Arthur Miller, Manager, Paver Department, Chain Belt Co., Milwaukee;

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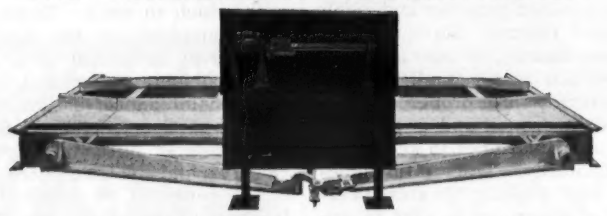
WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site.
Capacities: 15-18-20-30 Ton—Write us for your nearest distributor
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One Texas City* Cut Hot Asphalt Handling Costs Over 50%
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GRACE RAPID FIRE HEATER
heating tank car and loading hot asphalt into Grace 600 gal. kettle. (10,000 gal. storage tank not shown)

For further information use the handy coupon below.

W. E. GRACE MANUFACTURING COMPANY
6015 Lamar St. Dallas, Texas

Street patching and maintenance using OLD METHOD

Asphalt in barrels cost per gallon	$ .165
A six man crew emptied an average of 400 gals. per day into a 600 gal. kettle, heated, and applied it. Cost per gal.	.192
Total per gal.	**$.357**

WITH GRACE RAPID FIRE HEATER AND 10,000 GALLON STORAGE

Cost per gal. in tank cars	$ .082
A six man crew has 600 gal. kettle loaded at 8 a.m. with *Hot* asphalt and averaged applying 1,000 gals. per day—Cost	.077
Heating cost per gal. on Rapid Fire Heater, operating 9 hours per day (no allowance for depreciation), 3 kettles operating	.006
Total per gal.	**$.165**

Please send me information on the equipment check marked ✓
☐ Rapid Fire Heater
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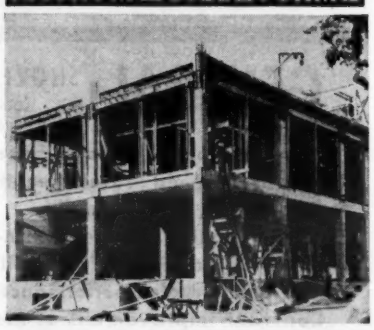

Cost records from job after job prove that Economy's system of Form Engineering and Rental Service means substantial savings in TIME — MATERIAL — MONEY for GREATER PROFITS.
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USE RIGHT BUCKET FOR THE JOB

Hayward makes all three—clamshell, electric motor, orange peel. A Hayward recommendation is unbiased.

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THE HAYWARD CO., 32-36 Dey St., New York
Hayward Buckets

Safety on Jobs Pays In Dollars and Cents

(*Continued from preceding page*)

Cloyd Richards, Service Manager, R. G. LeTourneau, Inc., Peoria, Ill.; William Miles, Manager, Industrial Division, Oliver Corp., Cleveland; and E. L. Nelson, Service Manager, Harnischfeger Corp., Milwaukee.

In answer to the first question, posed by Moderator Richardson, "What's being done to produce better and safer equipment?" each manufacturer representative stated briefly what his organization is doing. All are working along the same general lines. As much safety as possible and practical, consistent with reasonable cost and operating requirements, is being built into modern construction equipment. Mainly as an outgrowth of the war, detailed service manuals, lubrication charts, and instructions for using and caring for the equipment are furnished by the manufacturers. Many companies issue magazines for equipment operators. In these, hints and instructions on how to operate equipment properly and safely are a regular feature. Manufacturers' service departments and their field representatives are ready at all times to give instruction in proper (which means *safe*) operation and in care and maintenance of machines to keep them safe, mechanically. Tractor manufacturers are now working towards standardization of operation, so that an operator may switch from one make to another and find its operation familiar enough to enable him to run the machine easily and safely. But, the manufacturers agreed, complete job safety cannot be built into machines. That can come only from education for safety, training in the proper use of equipment, and adequate supervision on the job.

Challenged by Mr. Richardson to tell the manufacturers what they want in equipment, the contractors fired several specific requests at them. One was for electric starters, particularly on small units such as small compressors, mixers, pumps, etc. The difficulty of cold-weather starting was also mentioned. The problem here seems to be cost, though it was brought out that some of the engines used to power such units can be equipped with starters. Manufacturers suggested engine heaters and approved starting fluids to solve the cold-weather problem.

Another point brought up in the discussion was that accidents due to machine failure are more likely to be caused by faulty maintenance than faulty equipment. Answer to that: a regular thorough equipment-maintenance program. Manufacturers' manuals, their service departments, field representatives, and dealers can all help in this. But the responsibility for equipment maintenance and the proper training of operators rests with the contractor.

One of the contractors stated that the great difficulty lies in the unwillingness of the American worker to follow well established principles of safety. The American workman, he said, feels he's free—free to do what he pleases, regardless of consequences to himself, his fellow workers, his family, or his employer.

The consensus was that accident prevention is a cooperative affair, but it takes planning, training, and constant supervision on the job to make it safe and profitable.

Chairman's Report—New Officers

In his report on the year's activities, the retiring General Chairman, Otto S. Holmskog, Senior Construction Engineer, Employers Mutual Liability Insurance Co., Milwaukee, stated that the objective of the Executive Committee had been to give members more tools with which to work. These include a new pamphlet on the demolition of structures; industrial data sheets on center striping, cofferdams, and equipment maintenance; a film strip called "Building Construction Safety"; several posters; thirty new payroll enclosures; and the Committee's big project—a series of 58 tool-box talks for foremen to use on the job. The latter have been issued in a pamphlet well illustrated with drawings.

New officers elected for the 1949-50 year are: General Chairman, Joseph A. DeLuca, E. I. du Pont de Nemours & Co., Wilmington, Del.; Vice General Chairman, Samuel R. Bishop, architect of New York City; Secretary, Olive E. Potter, CONTRACTORS AND ENGINEERS MONTHLY, New York City; Chairman, Program Committee, Harold Sneed, De Walt, Inc., Lancaster, Pa.; Chairman, Membership Committee, Harry J. Kirk, Associated General Contractors, Washington, D. C.; Chairman, Engineering Committee, Robert L. Jenkins, Safety Division Office of Engineers, Washington, D. C. Three new members have been added to the Committee: C. B. Bronson of National Constructors Association, New York City; F. R. Griffin, Koppers Co., Pittsburgh; and Ralph Ward of Employers Mutual Liability Insurance Co., Milwaukee. Other committee chairmen and members are the same as last year.

At the conclusion of the final session, Mr. Holmskog was presented with a plaque in appreciation of his services and contribution to the work of the Construction Section, National Safety Council.

Joists and Columns Using Steel Forming

Removable steel forms for concrete joists and round columns are made by The Hausman Steel Co., 300 Sandusky Ave., Toledo, Ohio. Hausman forms are standardized: 5-inch joists at 25-inch centers. All equipment is shop-fabricated and the company furnishes and, if desired, erects and strips all pans, joist soffits, shores, and centering.

The soffits are long-length structural-steel channels and the forms are of long-length 14-gage steel—with tapered ends if required. According to the manufacturer, pans and stringers can be removed without disturbing the shores. Combination bar chairs and spreaders are placed in all joists. The adjustable round column forms are made of 20-gage spring steel. Column shafts can be furnished in diameters from 14 to 42 inches, in multiples of 2 inches. Conical heads can be furnished in diameters from 3 feet to 6 feet 6 inches, in multiples of 6 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 118.

Here's the modern, improved method of CONCRETE POURING

With CON-VAY-IT 12-20 Concrete Special you can place from ¼ to 1 cubic yards of wet concrete every minute — to a distance of 20 ft. horizontally, down, or up to an elevation of over 8 ft.

For travel distances over 20 ft. two or more of these remarkable units can be used in tandem (see photo).

Write today for information on this important new development.

Use this coupon for details.

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1115 W. Adams St., Chicago 7, Ill.
I am interested in your CON-VAY-IT 12-20 CONCRETE SPECIAL. Please send me full information on this machine.
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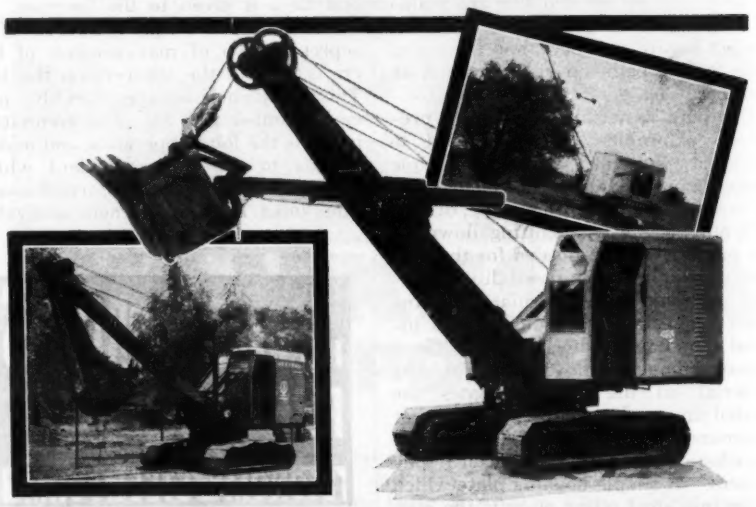
1115 W. ADAMS ST. • CHICAGO 7, ILLINOIS

A PIONEER of Small Excavating Equipment ...AND STILL A LEADER!



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Diesel, Gas, and Electric Powered . . . Wheel and Crawler Mounted. ½ and ¾ Cu. Yds.

Generals have always been known for speed . . . for strength and power . . . for flexibility . . . for the ability to take punishment day after day and still give uninterrupted performance. Constant improvement of the product through new engineering developments, has added to that reputation.

A typical General achievement is the self-propelled one-man, one-engine crane, on rubber. Similarly, the new General crawler-mounted shovels, cranes and draglines, etc., are making an enviable record of out-performing all other types of equipment of comparable rating. Write today for the latest details.

POWER SHOVELS • CRANES • DRAGLINES • CLAMSHELLS • BACKHOES • PILE DRIVERS

THE OSGOOD CO. O-G THE GENERAL CO. EXCAVATOR
MARION OHIO

DIESEL, GASOLINE OR ELECTRIC POWERED • ⅜ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

Your Mixing Problem Solved:—

Bituminous Pre-Mix Paving Materials can be produced with EASE in this NEW—HIGH SPEED—HIGH VOLUME —CONTINUOUS MIXER.

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SPECIFICATIONS

CAPACITY:	Up to one ton per minute
POWER:	Wisconsin or Equal Gasoline Engine 12 H.P. Air-cooled
PROPORTIONING:	Variable volume Rotor feed for aggregate. Variable volume pump with micrometer manual control for asphalt
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Write: McConnaughay EMULSIFIED ASPHALT PLANTS AND PROCESSES

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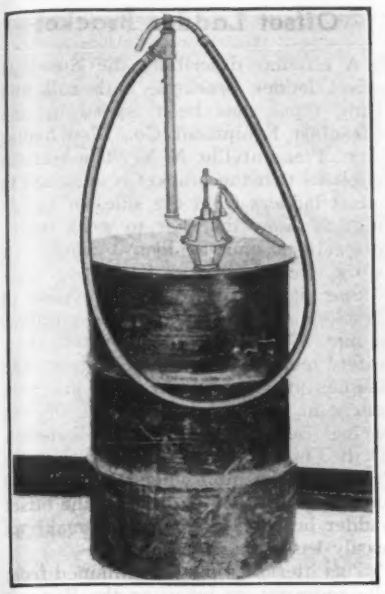


The No. 700-B refueling pump features a specially strong and durable diaphragm.

New Refueling Pump

A Nylon-cord Neoprene-coated diaphragm designed to stand up under gasoline and motor oils is the feature of a new refueling pump made by the General Scientific Equipment Co., 2700 W. Huntington St., Philadelphia 32, Pa. Intended for refueling tractors, trucks, or cars, the No. 700-B pumps about 7 gpm.

The hose is approximately 8 feet long and has a static wire to lessen fire hazard. A special tube is provided for motor oils. For underground and skid tanks the pump has very high suction and is self-priming, the company says. The automatic drainback feature permits draining the contents of hose and pump back into the tank. The lower casting is threaded for 1½ and 2-inch pipe. Each pump is fitted with an adjustable suction pipe and hose.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 24.

Oil-Hydraulic Products

An 8-page catalog titled "Commercial Oil Hydraulic Products", and describing pumps, motors, valves, cylinders, and manually operated units, is now offered by The Commercial Shearing & Stamping Co. of Youngstown, Ohio.

The pumps have capacities from 1 to 75 gpm with pressure up to 1000 psi. The motors range from 1 to 20 hp. Mounting may be of the flange or pedestal type, or made to order. Single-unit and tandem valves are offered with single-acting or double-acting control. Any number and sequence of sections are obtainable in one assembly with tandem-type valves, according to the manufacturer. The folder lists capacities and effective sleeve diameters for single and twin-cylinder multiple telescopic sleeves, and for single and double-acting single sleeves. Data on a line of manually operated pumps, with pressure up to 5,000 psi, are also presented.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 13.

Mack Realigns Territory Names Service Director

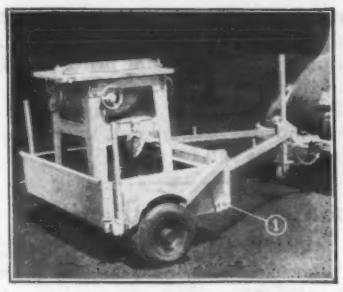
Mack Trucks, Inc., New York City, has created a new territorial sales unit known as the Southwestern Division, with headquarters in Dallas. Vice President D. C. Wheeler heads the new division, which takes in the company's established Dallas, Houston, Oklahoma City, and New Orleans offices; all of Texas, new Mexico, Louisiana, and Oklahoma; all of Arkansas except Mississippi and Crittenden Counties; the southern half of Mississippi; and Mexico.

The company has also appointed W. J. Corr Director of Service, a newly created post. Combining the former Service Engineering and General Service Departments under his command, Mr. Corr will oversee all parts and service activities for Mack trucks, buses, and fire apparatus. He will make his headquarters at the Plainfield, N. J., plant.

Granite-Products Catalog

A catalog describing a full line of granite products is now offered by H. E. Fletcher Co., Inc., of West Chelmsford, Mass. Specifications, applications, and illustrations are given for broken ashlar, flagging, durax blocks, rubble landscape blocks, standard granite curbs, vertical rubble edging, slope rubble edging, flagpole bases, and isolated inlet stones.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 30.



The Cargo Chariot is a general-utility trailer which will accommodate Wallace saws, jointers, shapers, etc. Numeral 1 points to the spring tension bar designed to give the trailer a smooth ride over rough roads.

Machine Trailers

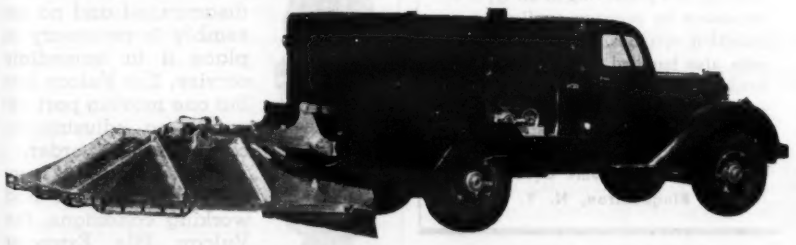
Announcing a new line of trailers for the transport of its woodworking machinery, J. D. Wallace & Co., 176 S. California Ave., Chicago 12, Ill., now offers these also in special models to suit other requirements for transporting machines from job to job.

New units include a Grasshopper model with a bare chassis for transporting the Wallace No. 1 radial saw; and the Cargo Chariot, a general-utility model. All have an airplane-type spring suspension for smoother riding. Leveling jacks in three positions permit the trailer to be disconnected from the towing unit and adjusted for best working height. In addition, the Cargo Chariot model has detachable springs so the body may be lowered to the pavement for ground-level loading of heavy equipment; then jacked up to riding height where the springs may be re-engaged for road use.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 23.

Clarkmoore Asphalt Surface Heater

Makes Street and Highway Funds Go Further



This asphalt surface heater is used to prepare the surface of old and worn out pavements for removal, by the application of intense heat . . . By this method worn and corrugated pavements of sheet asphalt, asphaltic concrete, plant mix, etc., can be restored to their original efficiency at a saving of approximately 35%.

This motor-propelled mobile unit will speed the work of repair and maintenance crews. . . . Proposal and Specifications on request.

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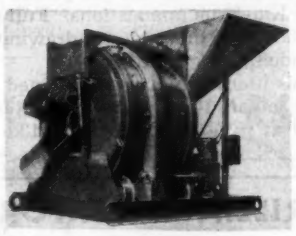
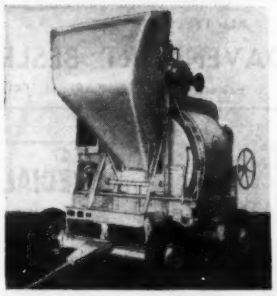


CMC 56-S TWO-YARDER

Specifically designed to facilitate increased Central Plant production on big jobs or in commercial plants. Advanced CMC engineering and features assure FASTER, SMOOTHER, and MORE EFFICIENT operation. Equipped with Timken Bearings throughout. Renewable hardened steel drum liners and hard alloy coated discharge buckets insure extra long life. Hydraulic finger-tip controlled charging and discharging.



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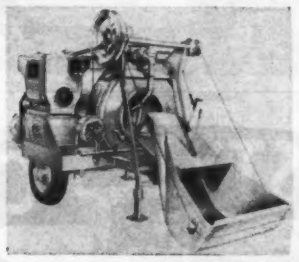
End or side discharge. Furnished in optional truck mountings. Compact construction for easy trailing and spotting on job. Timken roller bearing. Machined drum trucks. Improved stabilizers.



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HERE IS THE MOST VERSATILE MIXER ON WHEELS. Superior CMC design assures faster charging. This high-speed, non-tilt unit incorporates all the plus-value features that have made CMC mixers "tops in the field." Write today for latest illustrated catalog and prices

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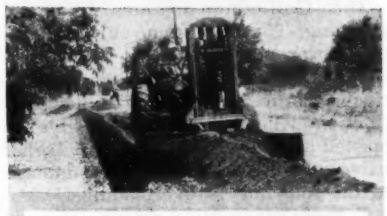
WATERLOO, IOWA

HOW TO DO MORE WORK PER MAN . . PER MACHINE

MINNEAPOLIS-MOLINE MODERN MACHINERY

INDUSTRIAL WHEELERS



Greater speed and ease of handling make MM Industrial Wheelers the natural choice for economy handling of construction and maintenance jobs. A complete selection of attaching or pull type equipment provides a wide range of job application.

Save Time On The Job . . . On The Road . . . Deliver More Loads Per Hour.

The "shuttle gear" for fast reversing . . . "roller steering" that makes easier handling of any load . . . enable MM Industrial Wheelers to handle more loads per hour on loading and dozing jobs with less operator fatigue. New UTIL "shuttle gear" actually gives an operator a choice of *6 forward* and *6 reverse speeds*. Speeds up to 14.5 m.p.h. save time on the job as well as road time between jobs. The "straight-line" principal used in "shuttle gear" shifting eliminates slow gear shifting, doubles the time saved and makes possible extra loads per hour.

Original equipment manufacturers prefer MM Industrial Wheelers and Power Units for their economy, dependability and ease of servicing.

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MINNEAPOLIS-MOLINE

MINNEAPOLIS 1, MINNESOTA

The Red Cross Carries On!

GIVE!

This portable hydraulic hand tool, the Guillotine, cuts ¾-inch reinforcing rod and 1-inch mild-steel rod.

Hydraulic Hand Tool Cuts Wire Rope, Rods

The new Manco Guillotine, a portable hydraulic hand tool with special center-cut blades designed to cut ¾-inch reinforcing rod and 1-inch mild-steel rod, has recently been announced by the Manco Mfg. Co. of Bradley, Ill. It may also be obtained with a shear-type blade designed to cut wire rope up to 1¼ inches and mild-steel rod up to ¾ inch. And it can be adapted to perform crimping, swedging, and bending operations on large-diameter material. The design of the 40-pound unit features special forgings and high-tensile-strength steel castings.

The Guillotine operates by hand pumping. The latest-type oil seals are used to prevent leakage at both maximum and minimum pressure. Other design features are a positive blade retraction when the release valve is opened after cutting, and a safety relief valve which prevents possible damage to the tool due to overloading.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 12.

Seal for Threading

A new thread-sealing compound available in handy stick form is now offered by the Armite Laboratories, 6609 Broad St., Los Angeles 1, Calif. The manufacturer claims that the application of this stick to any pipe threads before joints are made up provides a positive seal against gases, brine, acids, water, steam, and ammonia at high and low pressures and temperatures. It is also said to protect threads from seizing or galling, and to lubricate the joint. This compound, Thread-Tite, may be applied to threads in any type of material.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 63.

Submersible Sump Pump

A circular describing a new submersible bronze sump pump has recently been offered by Kenco, Inc., 159 Ridge St., Elyria, Ohio. Specifications, features, capacities, and prices are included in the bulletin.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 14.

Booklet on Construction With Light Steel Beams

A booklet describing Junior beams and titled "Skyscraper Construction for Every Building" is announced by Jones & Laughlin Steel Corp., 311 Ross St., Pittsburgh 30, Pa. Junior beams, an exclusive J&L product, are the lightest hot-rolled steel beams manufactured, the company says. The new 24-page booklet gives complete technical data on their installation and on Junior channels. It is fully illustrated with photographs of floor-joist and roof-purlin installations in progress. Individual sections of the booklet are devoted to construction of light-occupancy buildings, industrial buildings, and houses.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 50.

Materials-Handling Truck

A 4-page folder on the Kal-Truk, a ⅔-cubic-yard or 3,000-pound materials-handling truck, has been issued by the Kalamazoo Mfg. Co., Kalamazoo 24F, Mich. The bulletin points out that the Kal-Truk is built like a tractor and features a 13-hp 2-cylinder Wisconsin air-cooled engine, three forward and reverse speeds, a fully enclosed tractor clutch, and a full-floating drive axle.

A number of on-the-job photos illustrate Kal-Truk applications. Full specifications and dimensioned drawings are included in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 113.

The Choremaster is a two-man operated post-hole digger. For short hauls it is transported on easily mounted wheels.

Powered Hole Digger

A portable gasoline-powered hole digger is now being manufactured by the Choremaster Division of The Lodge & Shipley Co., 800 Evans St., Cincinnati 4, Ohio. According to the company, you need not tie up your tractor for post-hole digging; the Choremaster can be used wherever two men can stand and work in those hard-to-get-to spots.

The construction of the digger features aluminum-alloy casting, worm and worm-wheel transmission with a 50 to 1 overall reduction from engine to auger, anti-friction ball bearings, and a 9-inch-diameter 36-inch-long alloy-steel auger with replaceable hardened cutting edges.

The chassis of the Choremaster digger provides a mounting base not only for the engine but also for a compressor or generator, permitting other varied uses. The unit may be powered by a Briggs & Stratton Model N or the Clinton Models B706 and 700A engines.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 105.

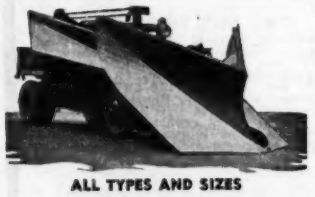
Offset Ladder Bracket

A circular describing the Steadfast offset ladder brackets, both rail and rung types, has been issued by the Steadfast Equipment Co., 57 Wheeler Ave., Pleasantville, N. Y. The bulletin explains that the bracket is designed to offset ladders from the sides of buildings to allow the user to work under projections and to lean towards his work instead of away from it.

Specifications for both types of brackets are included in the circular, along with an explanation of their safety features. The bulletin tells how ladders may be secured to any roof pitch or side wall, because of the swivel bearing plate on the bracket. Drilled holes may be used to anchor the bracket in position when desired. The company also points out that the offset ladder brackets used in pairs make an easily assembled scaffold.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 7.

BRILLIANT PERFORMANCE EVERY TRIP OUT



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No matter what the snow or ice conditions, you obtain FASTER ● SAFER ● CLEANER snow removal with the lighter, yet stronger, DAVENPORT-FRINK SNO-PLOWS. Available in "V" and Straight Blade types for all sizes of trucks, tractors, road patrols and locomotives. Once you see them at work, you know why they are engineer-preferred throughout the snow belt.

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VULCAN PILE EXTRACTORS

Fur pulling sheet steel, wood, concrete, H-beam and pipe piles.

Mechanical features engineered on correct principles make Vulcan the fast, modern economical pile extractor. Its parts cannot become disarranged and no assembly is necessary to place it in immediate service. The Vulcan has but one moving part, requires no adjustments, can't get out of order.

Proved since 1927 under both good and bad working conditions, the Vulcan Pile Extractor has justified every claim made for its efficiency, hardiness and performance. Three types built to handle every kind of pile extracting job. Write for full details.

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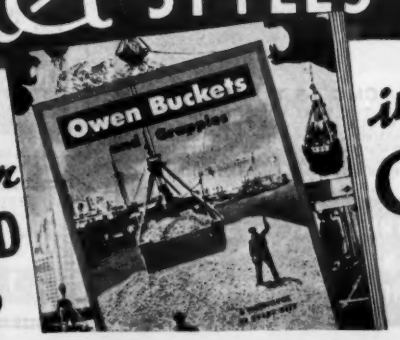

in this NEW Owen CATALOG

THE OWEN BUCKET COMPANY

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Kandiyohi County Highway Dept. Photos
Left, a radio-equipped 2-auger Snogo in action on a Kandiyohi County road. Above, a truck-mounted V-plow clears light snow at high speeds.

Rotary Plows Aid County Snow Fight

(*Continued from page* 1)

Willmar when a sudden snowstorm blew in. In desperation she called Ward, to see if there was any way she could get home. Ward advised her to stay where she was, leave her telephone number, and as soon as the plow passed her farm he would call her.

Picking up his radio transmitter, he called the plow and gave orders for the operator to tell him when he had passed that farm. True to his word, he called the woman a bit later. By sheer coincidence she had noted the time Ward called her; her husband had noted the time the plow passed the house. They compared notes and couldn't understand it. Several days later, still mystified, she came in to talk to Ward and find the reason behind this magic.

Ward explained as best he could. Still a little skeptical, the woman left, returning a few days later with a heaping basket full of Scandinavian pastry and plenty of coffee. The office force and mechanics enjoyed the lunch, and the farmer's wife probably enjoyed returning the favor Ward had done her.

How Snow Is Handled

Practically all of Kandiyohi County's roads are now 22 to 26 feet wide, with a high percentage of 24-foot highway. Much of the right-of-way is also 90 feet wide, which is a great help in storing the snow.

The plows all begin operation as soon as the snow starts, working according to a general priority plan. In other words, a main county road between towns with 100 cars a day rates earlier cleanup than a back country road between farmhouses, which only gets 25 cars a day.

All equipment is fitted with flashing blue lights, which now are standard with AASHO members. The V-plows push snow off the highway, and the wings push it back still farther and flatten down the ridge. In the case of bad storms which pile the snow up beyond the capacity of the V-plows, the rotaries are sent in.

The snow which falls here is as hard as rock after the blizzards are over. Ward and his men cannot explain it, except to say that sometimes the snow is wet, and the wind packs it extremely hard. Last winter Ward drove up to a Snogo working against an 8-foot drift, and a man had ridden a horse over the snow crust. He sat calmly up on top of the drift, perfectly secure, watching the machine at work. According to Ward, there are times when the heavy rotaries climb right up over the crust and can't dig in.

At such times men have to break the crust away with picks to let the machine get a foothold again.

Ward is convinced that alignment, proper construction and sloping can do much to reduce snow removal costs. Now that the agricultural folk of the county have come to expect that the roads will be open in winter as well as summer, Ward is spending a great deal of time and effort on this new phase of snow *prevention* rather than snow *removal*.

Following in the footsteps of other men who have tried the same thing successfully, Ward is constructing county highways with a 26-foot top, 3:1 side slopes, 4:1 backslopes wherever possible, and round-bottom ditches from 4 to 5 feet in depth. Some of the old original deep cuts are now being sloped gently back.

On these wide, raised roads, snow simply will not stay. The same high winds which swirl the snow and drive equipment off the old roads actually clean these more modern thoroughfares. Obsolete highway alignment and design, coupled with insufficient weed cleanup in autumn, and farmer's fences on narrow right-of-way, all do more to complicate the snow problem than anything else, Ward believes.

Wants No Heroes

The county wants no heroes. Ward's men work with their heads, instead of depending on blind courage. In a really bad storm, which can be expected five or six times each winter, equipment goes right out as soon as it starts to snow. But when the winds come up and swirling flakes drive everybody off the highway, it is also too dangerous for the snowplows to try to work. They return to Willmar and wait for the first break in the storm. That also gives the men a chance to rest.

Summer Maintenance Important

At the height of a December snowstorm around Willmar, the last thing

(*Concluded on next page*)

BACK-RIP SCARIFIER

RIPS in your dead-head time when backing for new load.

BACK-RIPPING Saves Contractors TIME, MONEY and EQUIPMENT.

Hinged teeth assemblies mount on back of Bulldozer moldboards.

SWINGS FREE WHEN DOZING

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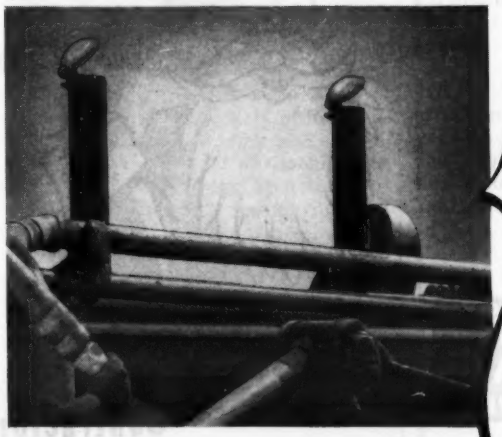
LOS ANGELES 46, CALIFORNIA

CANCAP KEEPS OUT HARMFUL RAIN AND WEATHER



Light cast aluminum lid pops open as engine starts. No back pressure.
Lid closes as engine stops, snugly fitting over exhaust pipe sealing it against weather.

TRACTOR EXHAUST SYSTEMS NOW AUTOMATICALLY PROTECTED FROM DAMAGING RAIN, SLEET, SNOW

CANCAPS seal exhaust pipes from rain and weather, effectively protecting costly equipment from moisture damage. CANCAPS reduce maintenance and repair expense. Save you hundreds of times their cost. Made with a light weight, aluminum cap and cadmium plated bracket, CANCAPS provide quiet, long lasting protection. The lightweight cap completely overlaps pipe, yet provides a soft opening action with no back pressure. Simple construction permits easy installation. Just slip bracket over edge of exhaust pipe and tighten lock nut and it is on to stay. No fittings or bushings are needed. Fully automatic in operation, CANCAPS never forget, and whenever weather turns bad, your equipment is always protected.

Order a supply now for the winter season ahead. Direct or from your dealer.

Low Cost Protection— 3 Sizes Fit All Exhaust Pipes from 1⅜" to 4¼"

No. 2 CANCAP—fits all exhaust pipes from 1⅜" to 2⅜" . . . $1.90 ea.
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continuous chain load binders

Canton loaders pick up slack in chain and bind loads in one continuous action. Special alloy construction with drop forged hooks provides exceptionally rugged strength. Fully guaranteed up to 30,000 lbs. capacity.

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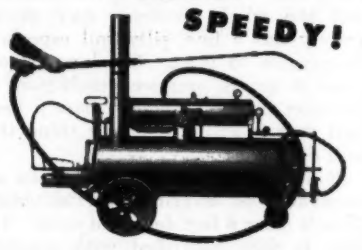
SIMPLE! SAFE! SPEEDY!



The time-saving, cost-cutting Siebring Steam Cleaner speeds repair work . . . saves costly man hours. Continuous flow of steam for hours assures fast, thorough cleaning on the toughest grease and dirt-packed jobs by providing steam or hot water or *both* UNDER PRESSURE, with powerful, cutting chemicals. First, it knocks loose, then it dissolves and removes the firmest holding, most stubborn dirt, grease, and grime.

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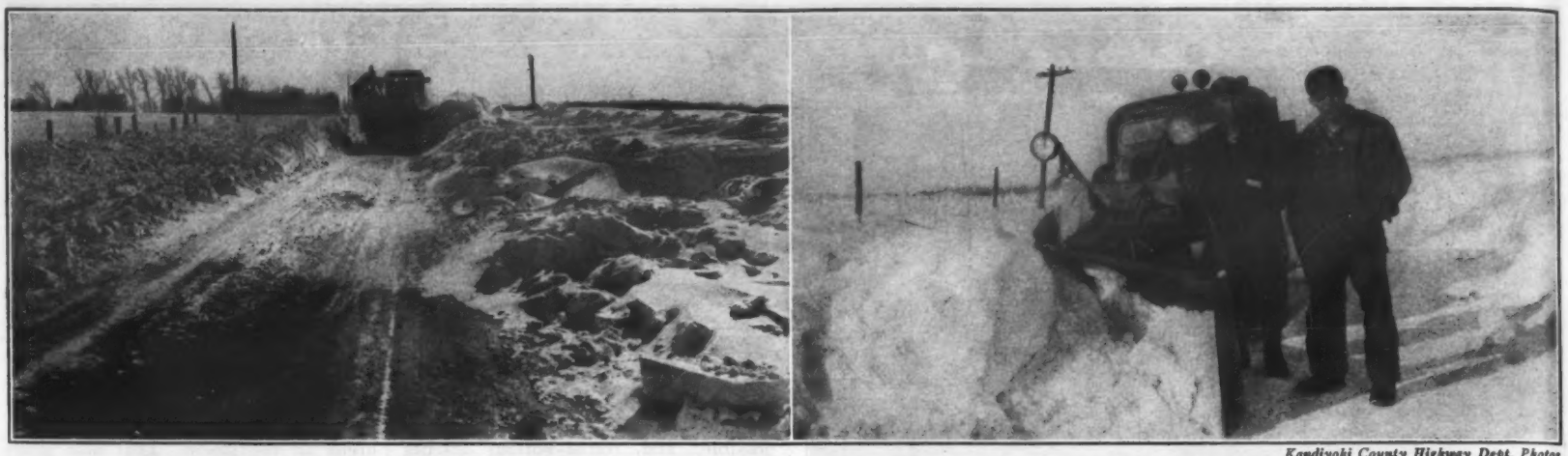

Kandiyohi County Highway Dept. Photos

A heavy truck with a V-plow moves snow off a Kandiyohi County road at left. At right, a push plow and its Scandinavian operators.

Rotary Plows Aid County Snow Fight

(*Continued from preceding page*)

on people's mind is summer maintenance. Yet, says Ward, summer maintenance is quite important if snow removal is to be effective.

Proper grading and re-shaping of the gravel surfaces in late autumn, just before the fall freeze, leaves the roads in shape to shed moisture when snow thaws occur. Only heads-up maintenance will leave every mile in shape so the road will drain, but that is the aim here.

Tall weeds left growing along the roadsides will often catch snow, build up drifts, and eventually result in a bad highway block. The remedy for this is of course obvious. That is what the power mowers on the county roster are for. Recent experiments with 2,4D and other weed control chemicals also show promise.

Frost boil damage as an aftermath of the winter season is one of Ward's worst problems; one he frankly admits he cannot solve by administration or anything else. He is fighting the situation, but the whole southern half of the county has a fine, silty soil especially vulnerable to frost. The large stockpiles of gravel produced each year by contract come in mighty handy here, and that is about the only thing that will do any good.

If at all possible, the frost boils are excavated by dragline, to full depth. This is often 6 feet deep and over. The spot is then backfilled with granular material of some kind, and topped by gravel. That almost always cures the trouble.

Where this is not possible because of the pressure of other work, Ward's men keep filling the spot with loads of gravel until eventually they succeed in building a floating gravel "bridge" across the spot. These places are never left through the summer, however, and every effort is made to eliminate them at the first opportunity.

A new era is dawning on Kandiyohi County, and it is almost imperceptible to the hardy Scandinavians who inhabit the place. County roads are now up to an all-time high standard. Snow removal is so effective that roads are seldom blocked for more than a few hours, and then only if the snow falls as a severe storm. People who live in this neat block of 24 townships have, without completely realizing it yet, entered into a new economic era, where they can go as their wishes dictate, over a model transportation system.

Ball and Roller Bearings

A 112-page catalog and engineering-data book on the company's complete line of ball and roller bearings is now offered by the Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.

Catalog No. 2550 points out product features and lists prices, weights, load ratings, and dimensions for the various standard models available. Pages of selection examples and drawings of typical applications simplify the selection of bearings for a specific service. Another page deals with replacement installations and the interchangeability of Series DE roller bearings with bearings of other makes. Still other sections cover welded-steel base plates, lubrication fitting data, maintenance and lubrication, shafting, etc. Five picture pages are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 3.

Two-Wheel Assembly In a Packaged Unit

Two-wheel single-axle assemblies, as complete packaged kits, are now available from The United Mfg. Co., 46 W. Interstate St., Bedford, Ohio. Shipped ready for attachment, these new units have been designed to provide mobility from less than 1,000 pounds to more than 7,000 pounds.

Each Caravan two-wheel unit consists of two hub and wheel assemblies, two leaf springs, side-frame or underframe mounting brackets, and a lunette or clevis type of hitch. In addition, the units can be supplied with 11, 12, or 14-inch brakes; an automatic brake-control device; and a front (third-wheel) landing-gear assembly. A hydraulically operated mechanism applies the trailer's mechanical brakes when the towing vehicle slows or stops. The front landing-gear unit features full swivel caster and fold-away retraction.

Two-wheel Caravan axles may be used for transporting generators, welding equipment, pumps, tar kettles, concrete mixers, steam cleaners, field service equipment, drills, and a range of other equipment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 120.

BEADLE OIL ROAD SMOOTHER

Cuts Costs 2/3!

Attach it to your grader for cutting and pulverizing high shoulders and bumps, filling in depressions, and compacting the material into a new wearing surface. Write for circular.

COATES MANUFACTURING COMPANY
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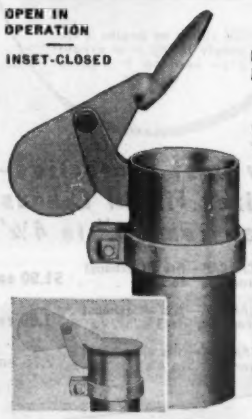
PROTECT ENGINES
ALL YEAR 'ROUND WITH
"WEATHERCAP"
EXHAUST PIPE COVERS

OPEN IN OPERATION — INSET-CLOSED

ENTIRELY AUTOMATIC

SIZES: 1-½" TO 5-¾" O.D.

A SIZE TO FIT ANY MAKE OR MODEL ENGINE— TRUCK— TRACTOR— TRAC-TRACTOR OR COMBINE



The "Weathercap" exhaust pipe cover is counterbalanced to open instantly from the engine exhaust pressure — closes automatically when engine shuts down. Simple protection against dirt, rain and insects during storage or idle periods. No restriction or back pressure, assuring full horsepower output.

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ARBA Conference Asks What Price More F-A?

If Federal Share of Highway Costs Is Upped, We Face Nationalization of Highways, Delegates Are Told

✦ A LOT more money needs to be spent if we're to have an adequate highway system. We're all agreed on that, said delegates and speakers at the fall conference of the American Road Builders' Association in Washington, November 7-8. But from now on is Uncle Sam to pay more than half of the check—say 60 to 75 percent of it? And if he does, what then? A corresponding increase in his control over roads? In ten years, say, 100 per cent Federal financing of a nationalized interstate highway system? Eventually, perhaps, socialization of all means of transportation in the U. S.? *Can* it happen here?

That was the question 250 delegates from 19 states mulled on their homeward journeys after the tense final session of the conference. That was the question that would be uppermost in their minds when Congress convenes early next year to consider highway needs and a multi-billion-dollar Federal appropriation to them.

Contract System vs. Day Labor

In a somewhat lower key, the opening session of the conference had posed the same issue: America at the socialistic fork in the road. But there the question was not who shall pick up the check but who shall do the work—private contractors or public agencies employing day labor?

Of more than $2,000,000,000 worth of Federal-Aid highway construction since the war, only 1 per cent was done by day labor, said A. C. Clark, Acting Deputy Commissioner, Department of Construction and Maintenance, Bureau of Public Roads. In fact, where Federal funds are used for highway work, Mr. Clark added, the Bureau of Public Roads requires, and will continue to require, the contract method almost exclusively. Why? Because it costs less, takes less time, and turns out a better job.

It has been argued, said Mr. Clark, that the day-labor system saves the cost of the contractor's taxes, fees, and premiums, as well as his profit. But his premiums and taxes revert to John Q. Public's coffer in one form or another, and his profit—his bonus for efficient work—he earns by finding ways to reduce his costs and underbid his competition.

Contractor Archer B. Gay, Secretary-Treasurer of the Virginia Road Builders' Association, called day labor a "cancerous growth" in the U. S. economy. It's more costly than the contract system, yes. But even more serious, he said, it increases the possibilities of political manipulation and patronage—and it marks the entrance of government agencies into private business. The step is a short one from government building of highways to government manufacturing of equipment, producing of aggregates, etc. Day labor drives an opening wedge for socialism, said Mr. Gay. Calling as it does for local government to *build* as well as *provide* roads, said Dr. George C. Smith, Research Economist of the U. S. Chamber of Commerce, day labor is another phase of the growing U. S. "controlism" movement.

Speaking for William Green, President of the AFL, Lewis G. Hines stressed labor's stake in the free-enterprise system. Labor prefers to work for private rather than public agencies, he said. It believes firmly in a "reasonable profit" for the employer, provided the worker gets a "fair day's wage" for a "fair day's work", added Chairman Nello L. Teer, Jr., President of the Contractors Division of the ARBA.

Expanded F-A Road Program

The second session—presided over by Col. Enoch R. Needles, ARBA President—dealt with the inadequacies of our highway system and the problems of correcting them.

Bureau of Public Roads Commissioner Thomas H. MacDonald cited the inadequacies — chief among them the lack of legislative sanctions for highway departments to reorganize, establish a career service for competent people, and secure cooperation with local government units.

Samuel C. Hadden, Chairman of the Indiana State Highway Commission, cited the problems confronting the states if they are to meet an expanded F-A highway program—chief among them the problem of raising adequate matching funds when local and state units seek to take from one another instead of joining forces to increase the total to be divided, and when they are opposed in the legislatures by special interests such as the petroleum and trucking industries.

Mr. Hadden favors a 75-25 Federal-state split in the cost of construction on the interstate highway system. And any future F-A expansion will be absorbed for some time to come by the states, he said, since the local government units cannot supply proper engineering supervision or do the work promptly enough. As for the special interests, the only answer to them is to keep the public informed of its stake in an adequate highway system.

John Darr, President of the Institute of Public Relations, had something to say on that. Industry spends millions of dollars every year, he pointed out, to sell us on wearing neckties or pajamas, or on drinking beer. But how much do we spend to sell the public on its stake in highways? The public *can* be sold if we learn to deal with many publics—highway users, real-estate owners, city dwellers, for example—each with its special interests needing special handling.

What Share of Costs for Uncle Sam?

After a luncheon at which Cornelius V. Whitney, Under Secretary of Commerce, welcomed the Bureau of Roads into the Department of Commerce, the road builders took their places for the final and crucial conference discussion on the topic: What percentage of highway construction costs should Uncle Sam pay?

Dawes E. Brisbine, Research Counsel of the National Highway Users' Conference, led off with a warning. A 158 per cent increase in Federal highway appropriations is contemplated in the bills Congress will consider in 1950. Is that increase justified in view of our national debt, he asked? If the states begin to put up only $1 for the Government's $3, will not their importance and sovereignty diminish accordingly? Let's weigh very carefully any increase in the Federal share, counseled Mr. Brisbine. With the national economy and our traditional state sovereignty at stake, let's not be hasty.

Harold F. Hammond, Manager of the Transportation and Communications Department of the U. S. Chamber of Commerce, took up the cudgels too. These are the disadvantages of increasing the Federal share of construction costs, he said: (1) Anyone who owns more than 50 per cent of a corporation's stock has control of that corporation; so too if the Federal government has more than a 50 per cent financial interest in the interstate highway system. (2) With 48 states weeping over their lost control, a nationalized interstate highway system may result, with perhaps a Federal highway police force. (3) And as the next step, why not nationalization of all competing systems of transportation?

We're at a fork in the road, he told the delegates. We can go on maintaining our traditional balance between the states and the Federal government in highway financing and responsibilities—or we can take the one more step toward nationalization of our highway industry.

Perhaps the only cheerful aspect of this closing session of the conference—as ARBA Treasurer Jennings Randolph pointed out in his address—was the example it afforded of free discussion in a still-free country, the example of democracy at work.

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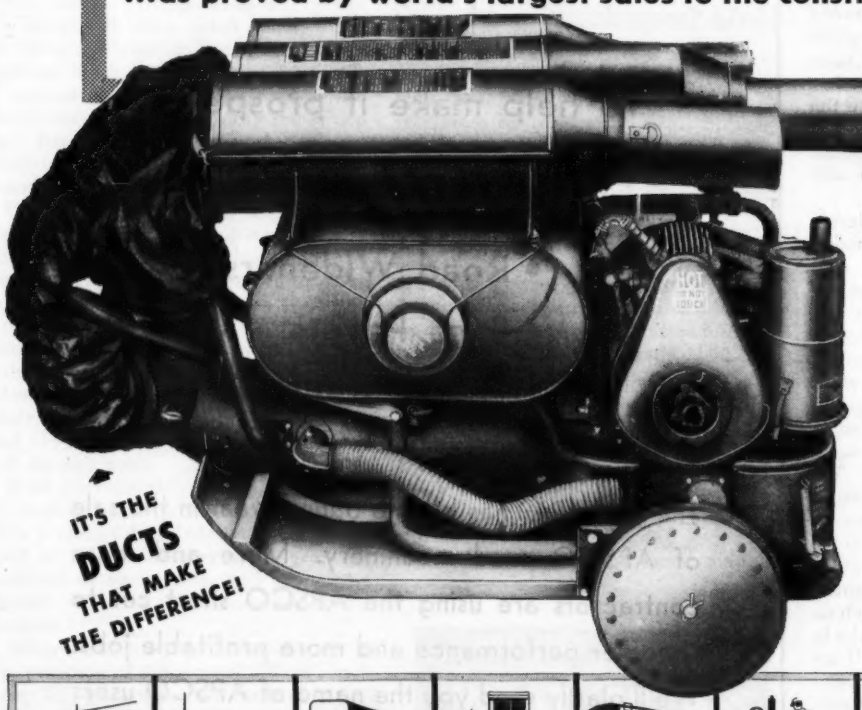

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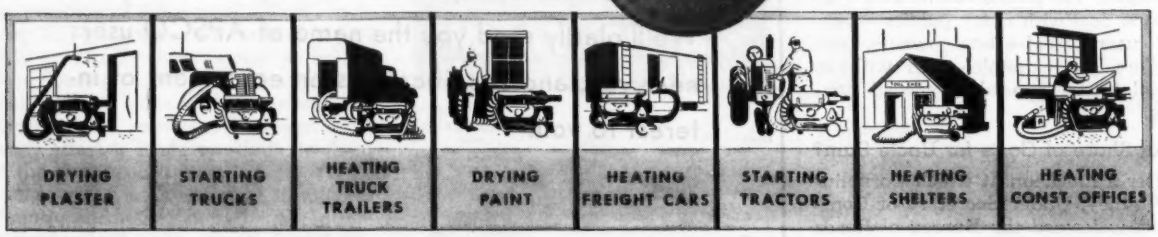

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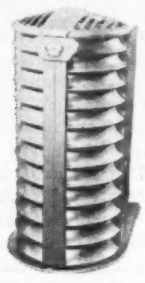

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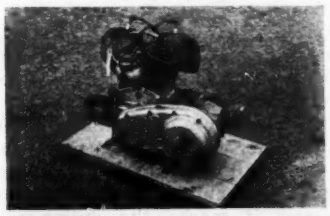

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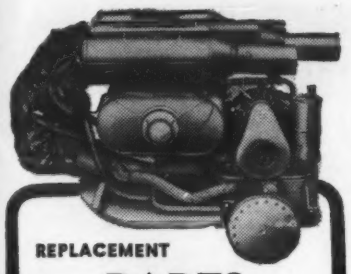

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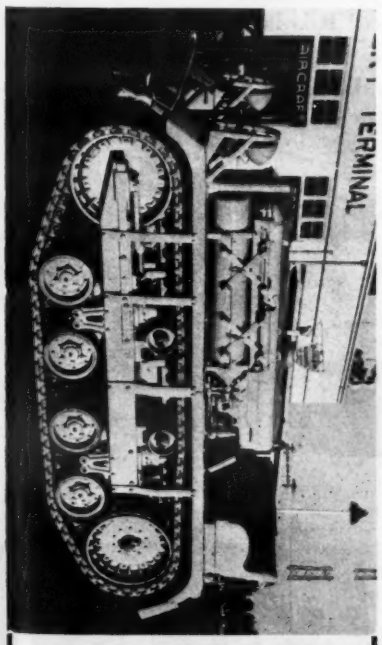

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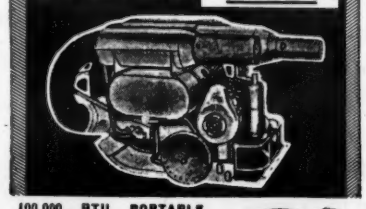

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